DECEMBER NINETEEN THIRTY SEVEN

Rock Products

THE INDUSTRY'S RECOGNIZED AUTHORITY

BIG RESULTS *with a* LITTLE PUMP

Lincoln Sand Company

About 80 tons per hour are handled by this 6" Hydroseal Dredge Pump, for the 100 ton sand bin on the shore, 500 feet away (elevation 60 feet) is filled in about 1½ hours, yet 10% to 20% of the material pumped must be screened out as oversize . . . A 75 H. P. Diesel was originally thought necessary to drive the pump, but it was later found that the surplus power, made available by the Hydroseal Principle, was adequate for the following:

(1) To generate electricity to drive the cutter head at the pump suction and to supply various electric lights around the plant.

(2) To furnish power for the pump which supplies water to the agitating nozzles at the pump suction.

Address nearest office listed at right for a copy of our catalog No. 836 or any other information.

HYDROSEAL *Dredge* PUMPS

ASH

HYDROSEAL AND MAXIMIX DESIGNS ARE COVERED BY PATENTS AND APPLICATIONS IN THE MAJOR MINING CENTERS OF THE WORLD AND CAN BE PURCHASED ONLY THROUGH THE FOLLOWING COMPANIES

•

PHILADELPHIA
MAIN OFFICE
The Allen-Sherman-Hoff Co.
221 So. 15th Street

ATLANTA
Boiler Equipment Service Co.
586 Greenwood Ave., N.E.

BOSTON
F. D. Rogers
89 Broad Street

CHICAGO
The Allen-Sherman-Hoff Co.
407 So. Dearborn Street

CLEVELAND
H. F. Bauer
304 Chester Twelfth Bldg.

DENVER
Shubart & Schloss
520 Boston Bldg.

DETROIT
Coon DeVisser Company
2051 West Lafayette Blvd.

MULBERRY, FLA.
Mulberry Supply Company

NEW ORLEANS
Walter Cooke
846 Baronne Street

NEW YORK
Simler & Sengstaken, Inc.
271 Madison Avenue

PITTSBURGH
Dravo-Doyle Company
Dravo Bldg.

SALT LAKE CITY
The National Equipment Co.
101 West Second South Street

SAN FRANCISCO
The Merrill Company
343 Sansome Street

ST. PAUL
Borchert-Ingersoll, Inc.
2375 University Avenue

ST. LOUIS
Rhodes Equipment Company
Field Bldg.

WILKES-BARRE
Power Engineering Corp.
517 Brooks Bldg.

•

CANADA
Allen-Sherman-Hoff, Ltd.
602 Colonial Building
11 King Street, West, Toronto

ENGLAND
The Ash Co. (London), Ltd.
79/80 Petty France
Westminster, S.W. 1, London

PHILIPPINES
Atkins-Kroll & Company
Insular Life Bldg., Manila

AUSTRALIA
Crossle & Duff, Pty., Ltd.
360 Collins Street, Melbourne

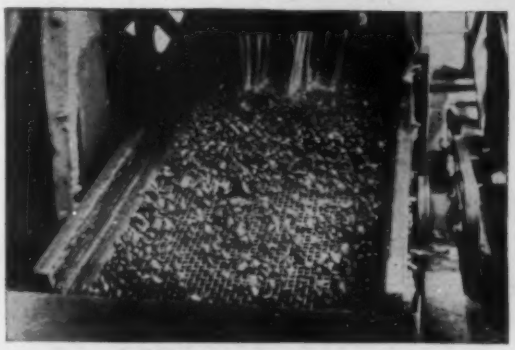
SOUTH AFRICA
The Denver Machinery Co.
206-8 Commissioner Street
Johannesburg, Union of S.A.

During the Winter— Prepare for Spring

New Link-Belt sand and gravel plant of Bellamy Sand & Gravel Company, Correctionville, Iowa. Capacity 100 tons per hour of gravel and same amount of sand. This plant is equipped with reciprocating feeder, anti-friction belt conveyor with self-aligning troughing idlers, shaking picking table for more efficient hand picking of shale and soft stone, heavy duty scrubber for cleaning ¾ inch gravel, and Shaw Classifiers for accurate sand classification.

SAND RECOVERY

The Rotoscoop is a perfected sand dewatering unit which is capable of recovering fine grains and discharging dry enough for truck transportation. Send for Folder No. 1463.



SCREENING

Supplement your rotary screens with Link-Belt vibrating screens to obtain a better grading of the smaller sizes of gravel or stone. Rotary screens for better washing—vibrating screens for better sizing. The combination of both rotary and vibrating screens assures your ability to meet the most rigid specifications.

● Plan for lower operating costs and a better product when your plant opens up next spring, by making replacements and additions to your equipment now.

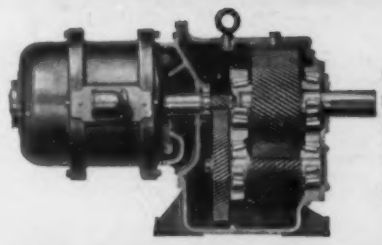
To take fullest advantage of the greater opportunities which should come from Government and other work, you must be able to meet rigid specifications.

A few suggestions for profitable modernization are illustrated. There are others. Send for Book No. 1240.

Address Link-Belt Company, Chicago, Philadelphia, Indianapolis, Atlanta, San Francisco, Toronto, or any of our other offices located in principal cities.

7241

●



REPLACE OPEN GEAR DRIVES

Greater efficiency as well as safety can be obtained by using Link-Belt speed reducers. The Link-Belt line includes herringbone gear, worm gear and motorized helical gear reducers as well as variable speed transmissions, silent chain and roller chain drives.

BELT CONVEYORS

Replace your old, plain-bearing belt conveyor idlers with modern Link-Belt anti-friction bearing idlers. Save power, assure dependability and cut down maintenance costs. The conveyor illustrated is equipped with the Link-Belt positive self-aligning idler which automatically and positively maintains the troughed conveyor belt central at all times.

LINK-BELT

Equipment for Handling Sand, Gravel, Stone

Rock Products

With which has been consolidated the journals

CEMENT and ENGINEERING NEWS CONCRETE PRODUCTS

Founded 1896 Est. 1918

RECOGNIZED THE WORLD OVER AS THE LEADER IN ITS FIELD

Contents

DECEMBER, 1937

▼ ▼ ▼

DEPARTMENTS

Owned and Published by

TRADEPRESS PUBLISHING CORPORATION

PUBLICATION OFFICES

205 West Wacker Drive, Chicago, Ill.

Telephone—Central 0670

GEORGE C. WILLIAMS, General Manager

L. V. RODDA, Circulation Manager

RALPH G. WHITE, Advertising Manager

Advertising Representatives

George M. Earnshaw, Eastern Manager, 56 W. 45th St., New York City, Tel. Murray Hill 2-3006

850 Euclid Ave., Cleveland, Ohio Tel. Cherry 4050

Louis C. Thaon, Western Representative, Chicago office, Tel. Central 0670

H. W. Booth, West Coast Representative, 524 Spring St., Los Angeles, Calif.

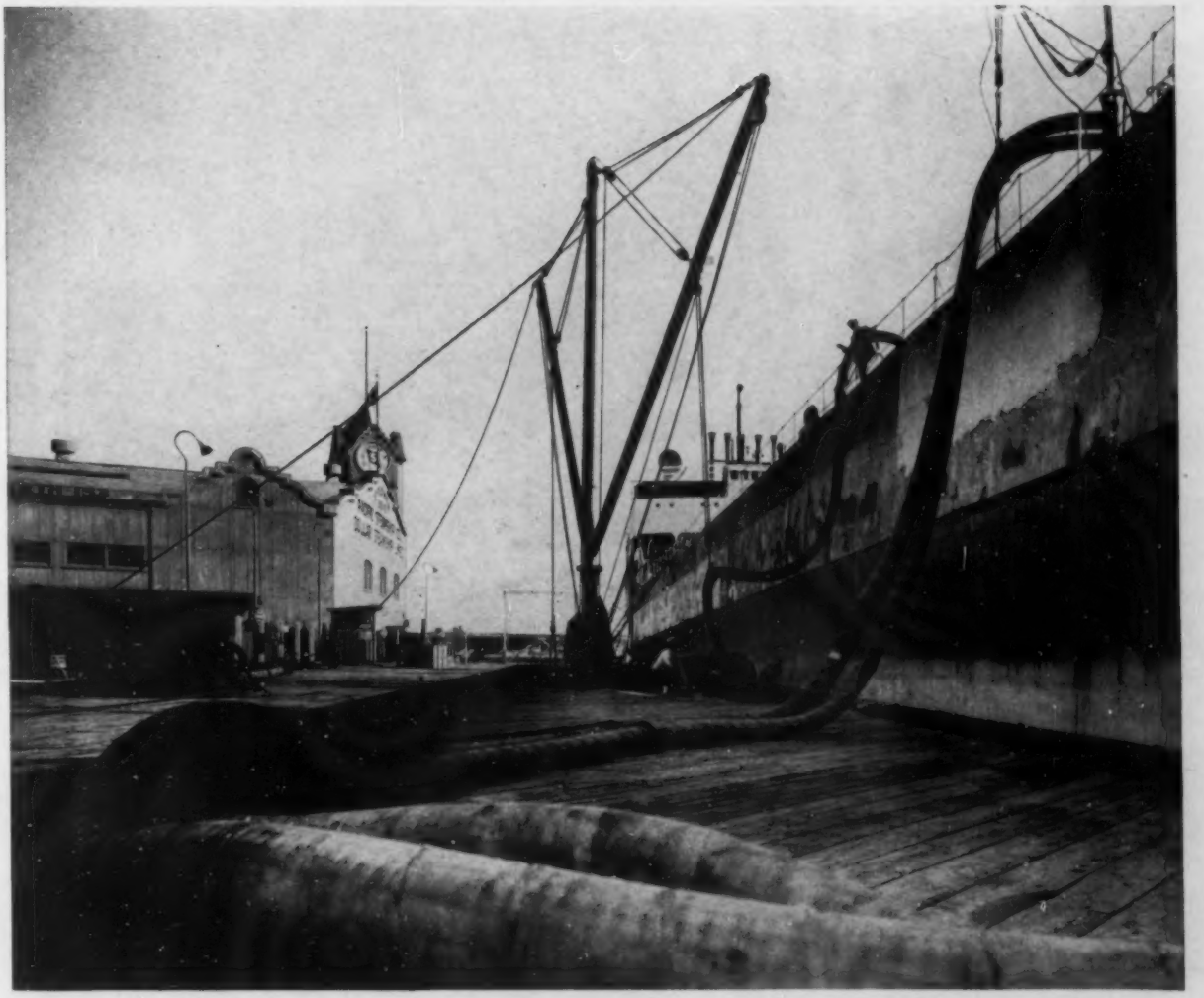
London Office

J. K. ROSS-DUGGAN, Manager, 2, 3, 4 Cockspur St., S.W. 1, England

Indexed in the Industrial Arts Index. Published Monthly. Subscription Price: United States and Possessions, Mexico, Cuba, Canada, $2.00; and $4.00 to foreign countries. Twenty-five cents for single copies.

To Subscribers—Date on envelope indicates issue with which your subscription expires. In writing to have address changed, give old as well as new address.

Entered as second-class matter, Jan. 30, 1936 at the Chicago, Ill., postoffice, under the Act of March 3, 1879.



MORE GASOLINE IN TEN MINUTES THAN YOU WILL USE IN 30 YEARS

A typical example of Goodrich improvement in rubber

IN THE next 30 years you will probably use 36,000 gallons of gasoline. Sounds like a lot, doesn't it? Yet every one of the above lengths of Goodrich hose handles more than that, from shore tanks to tankers, in ten minutes.

Cheapest way to transport gasoline or oil is by water. But loading and unloading big tankers was an expensive problem.

Then Goodrich developed a special hose for the purpose, capable of standing such terrific pressure or suction that one length of hose can fill or empty a 3,500,000-gallon tanker in less than a day.

Pressure to force such a volume of oil from shore tanks across docks, up ship side and across decks often pulsates so that the hose whips and thrashes like a mammoth serpent. But Goodrich engineers designed their hose to withstand that abrasion, resist pressure that would burst ordinary types of hose, resist the attack of oil which ruins most rubber, and withstand pressure from the outside when suction is applied to unload the tanker at destination.

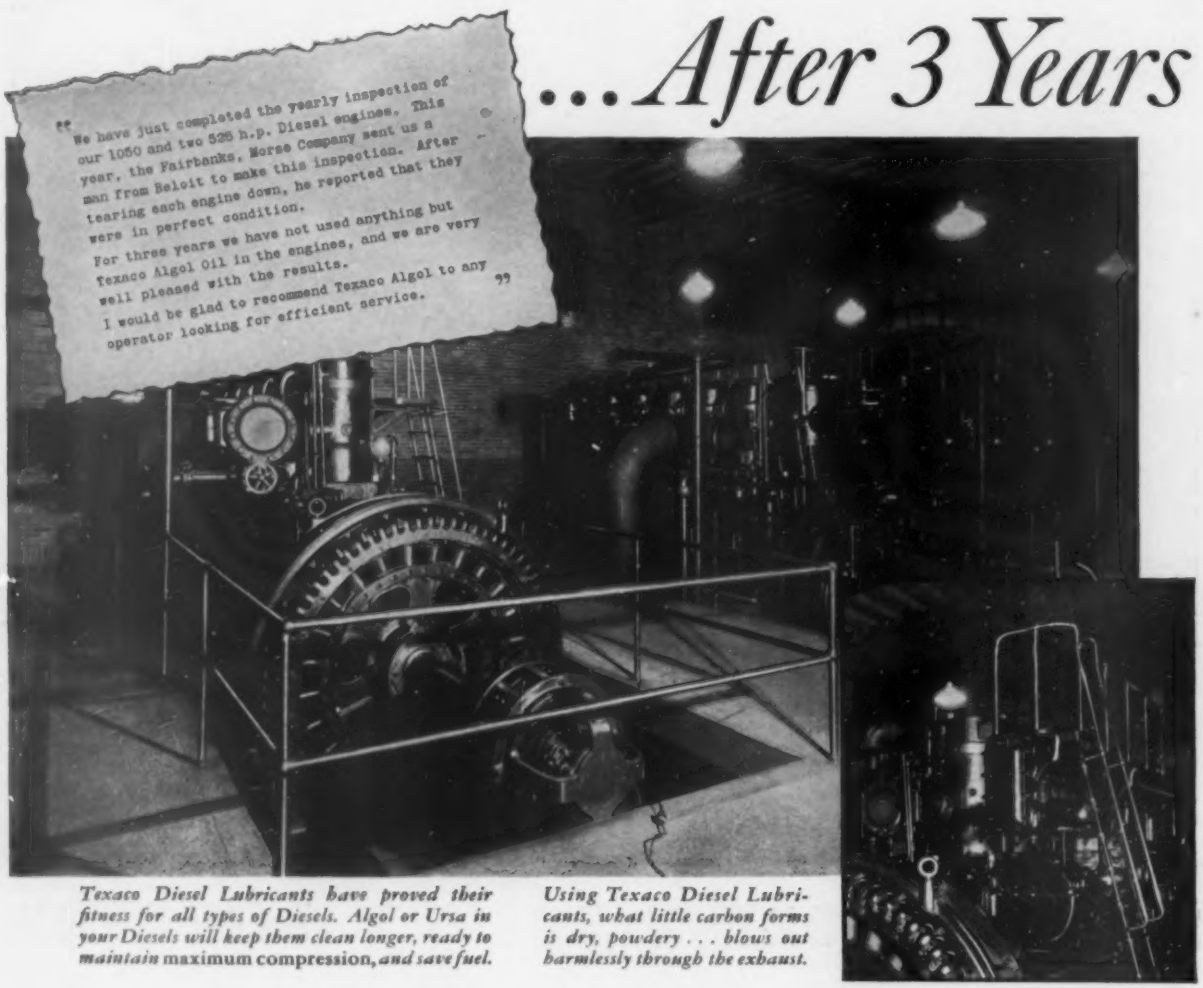
Here was a product presenting not one problem but many, all solved by the same Goodrich engineers who are constantly at work to improve hose, belting and every Goodrich product. These engineers have been responsible for many of the most far-reaching improvements in rubber—improvements which have increased its age, flexibility, and resistance to abrasion, chemicals, heat. When you specify Goodrich to your mechanical rubber goods distributor you automatically get all the benefit of these improvements, no matter how small or large your order, no matter how standard or special the product you buy. The B. F. Goodrich Company, Mechanical Rubber Goods Division, Akron, Ohio.

Goodrich

ALL *products problems* IN RUBBER

 Another story of Goodrich development work appears on page 112.

"PERFECT" ...After 3 Years



Texaco Diesel Lubricants have proved their fitness for all types of Diesels. Algol or Ursa in your Diesels will keep them clean longer, ready to maintain maximum compression, *and save fuel.*

Using Texaco Diesel Lubricants, what little carbon forms is dry, powdery . . . blows out harmlessly through the exhaust.

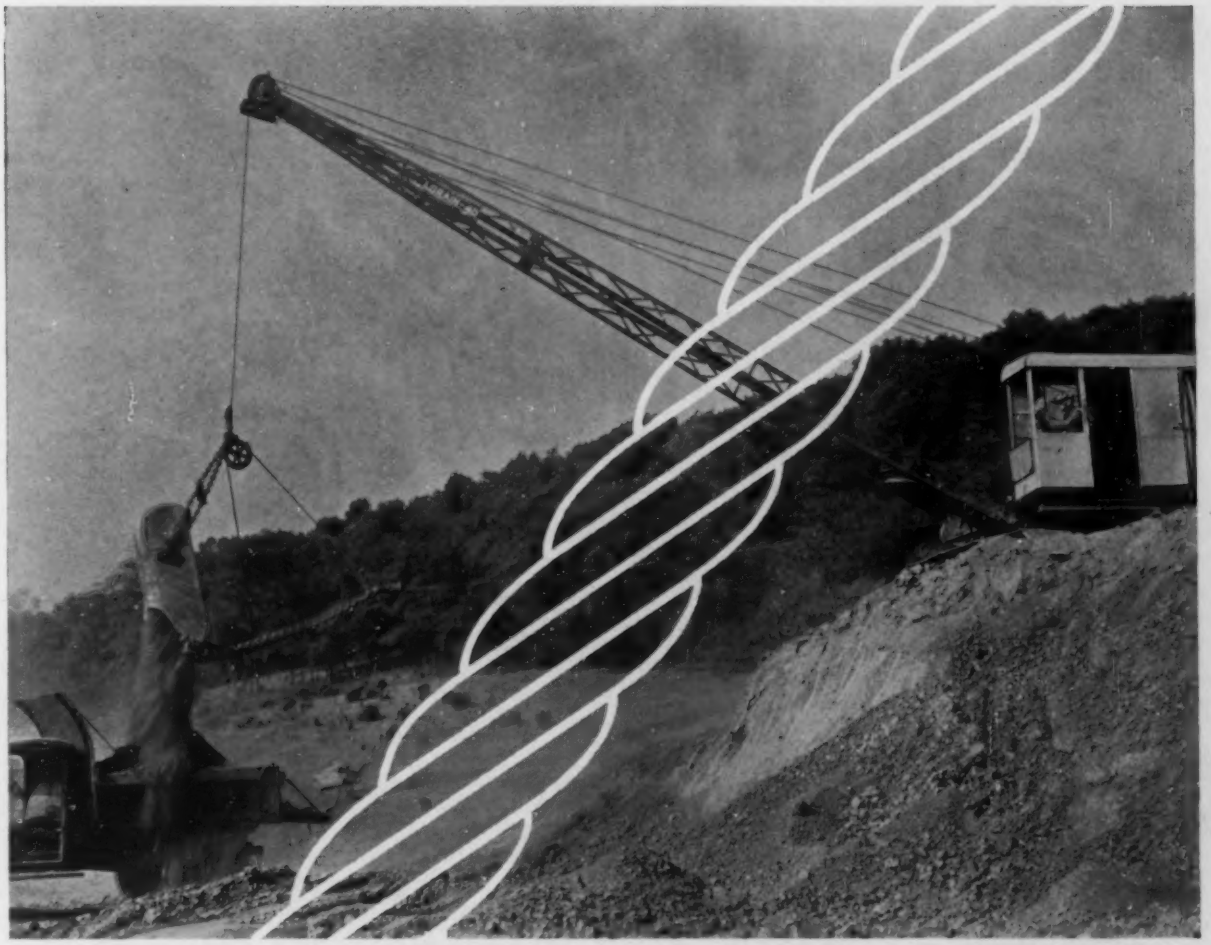
LETTERS LIKE THIS—from operators of both large and small plants—show that these men have proved to *themselves* what Texaco Diesel Lubricants do in actual service. As a direct result of such performance, *more Diesel h.p. in the U.S. is lubricated with Texaco than with any other brand.*

Trained lubrication engineers are available for consultation on the selection and application of Texaco Diesel Lubricants. Prompt deliveries assured through 2070 warehouse plants throughout the United States.

The Texas Company, 135 East 42nd Street, New York City.

TEXACO *LUBRICANTS FOR ALL TYPES OF DIESELS*

It's KNOW HOW *that counts*



in Wire Rope

And there's plenty of "know how" back of Bethlehem Wire Rope — the accumulated experience of half a century of wire-rope manufacture by the Williamsport Wire Rope Company, recently acquired by Bethlehem. Take Drag Line on a boom machine, for example. Highest-strength steel is always specified. 6x19 lang-lay construction is universally used. Yet, even with these two points standardized among all rope makers, Bethlehem Drag Line has won high favor among contractors.

"Know how" enables Bethlehem to build a perfected drag line—having definite features, unique in Bethlehem ropes, which combat abrasive wear and resist the whipping action of casting. For one thing, the strands, whether Form-Set (preformed) or standard, are "back turned." As wire is twisted into strand, the individual wires themselves are given a slight twist, making them hug together. Likewise, as the strands are twisted into rope, the individual strands are twisted slightly making a tight, solid surface to the line . . . a surface that has greater resistance to abrasion. This same "back turning" of the wires and strands balances internal stresses of the rope and makes it less kinky, less likely to bird-cage, easier to handle.

A small point, perhaps. Yet any contractor familiar with Bethlehem (formerly Williamsport) Rope can immediately tell the difference. Bethlehem rope casts better. It won't twist when let loose. It wears longer.

Whether its Purple-Strand Perfected Drag Line, Purple-Strand Form-Set Hoist Line, or wire rope for some other use, you'll find this "know how" invariably present in Bethlehem Lines.

BETHLEHEM STEEL COMPANY

THE MOST ECONOMICAL TOOL *Ever Developed* FOR ROCK DRILLING

Any way you look at it the TIMKEN Rock Bit effects large savings for its users.

It saves time because it drills faster. It saves money because it lasts longer.

These are direct, fundamental economies resulting from the streamlined design of the TIMKEN Bit and the material from which it is made (TIMKEN Steel).

Other economic advantages of a more or less indirect but no less valuable nature are: Less capital investment in drill steel. Less capital investment in forging and heat treating equipment. Reduced nipping costs.

Forged steel has had its day—and a long day it was. Progress will have its way, however, and a more modern, more efficient tool—the TIMKEN Removable Rock Bit—is rapidly taking its place.

If you are not using TIMKEN Bits it will pay you to give them a thorough trial. Write for name and address of nearest distributor.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

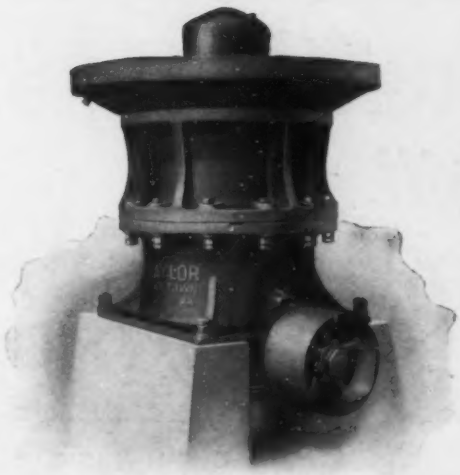
TIMKEN

ROCK BITS

Manufacturers of Timken Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; Timken Alloy Steels and Carbon and Alloy Seamless Tubing; Timken Rock Bits; and Timken Fuel Injection Equipment.

8 Budd-built Zephyrs are now rolling on TIMKEN Bearings.

Glide — as you ride a Timken-equipped Train



A PAIR OF RECORD-BREAKERS BY TRAYLOR

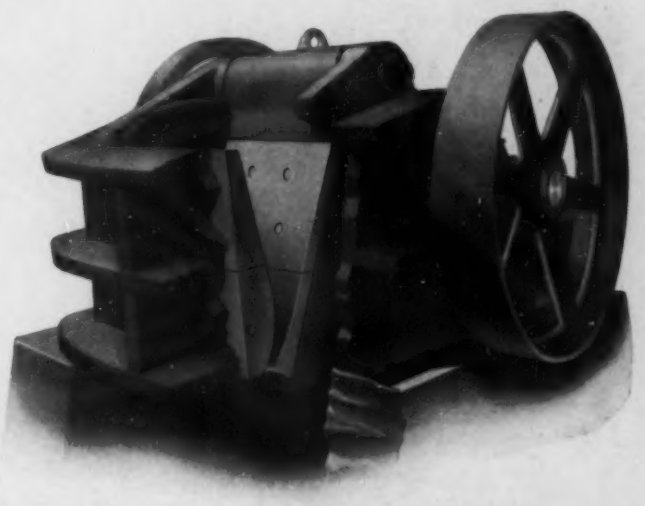
WE DID NOT set out to make a pun when we wrote the caption, but whether our Type TY Reduction Crusher (top) and our Type H Blake Jaw Crusher (bottom) are called "record-breakers" or "record breakers", the two mean very much the same thing, and they are true, because both machines have made records of production and are otherwise performing in a manner highly satisfactory to their owners.

The Type TY machine, the fastest-selling crusher we ever built, is of simple design, with cast steel frame having the spider integral and all around bottom discharge, roller bearing countershaft, cut gears, and patented dust seal, force-feed lubrication and Traylor Original, Non-Chokable Bell Head and Curved Concaves.

The Type H Crusher is of very much simplified Blake design with full-welded, all-steel frame and fitted with curved jaw plates that employ the principle of the Bell Heads and Curved Concaves of the TY machine.

Because of this principle, both crushers, in their respective spheres, have a much greater output, to smaller size product of greater uniformity, at no increase in the power used by machines with the older, straight design of heads, concaves and jaw plates.

Other advantages of these ultra-modern crushers are fully set forth in our Bulletins 3012 (TY) and 105 (H) which all operators should see, for their own profit. Write for YOUR copies now, today!



TRAYLOR ENGINEERING & MANUFACTURING CO.

ALLENTOWN, PENNSYLVANIA, U.S.A.

NEW YORK CITY 3916 Empire State Bldg.
CHICAGO 815 One La Salle Street Bldg.
SALT LAKE CITY 101 West Second South St.
LOS ANGELES 919 Chester Williams Bldg.
SEATTLE 6311 22nd Ave., N. E.

THE CANADIAN FAIRBANKS-MORSE CO., LTD.
980 St. Antoine St., Montreal, P. Q. Canada

B. C. EQUIPMENT CO.
Vancouver, B. C., Canada

MAQUINARIA
Isabel De Catolica 40, Mexico, D.F.

MANILA MACH. & SUPPLY CO.
Manila and Baguio, P. I.

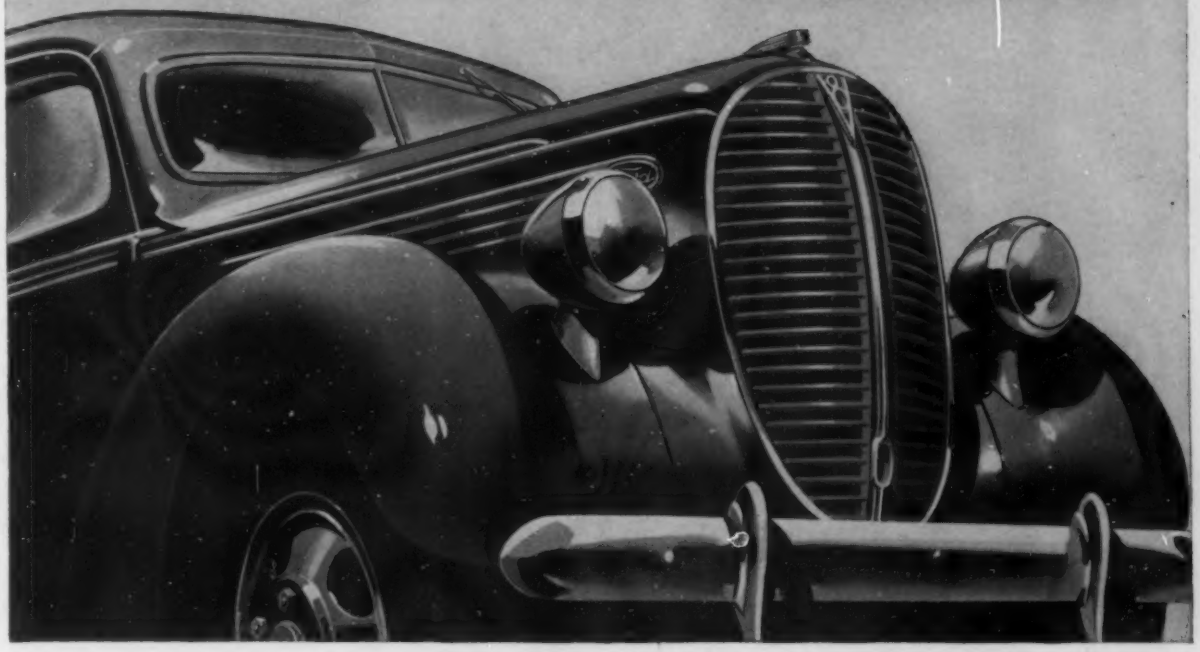
Export Department—104 Pearl St., New York City. Foreign Sales Agencies: London, Lima, Sao Paulo, Rio de Janeiro, Buenos Aires, Santiago, Valparaiso, Antofagasta, Iquique, Oruro

European Works—Usines Carels Freres, Ghent, Belgium

ANNOUNCING THE 1938 LINE OF

FORD V-8 TRUCKS

INCLUDING A NEW One-Tonner



FORD OFFERS WIDE RANGE. FAMOUS V-8 ENGINE BRINGS NEW ECONOMY TO LOADS IN ONE-TON RANGE

THE Ford Motor Company has built more than four million trucks. With this great background of experience, it means something to say that the 1938 Ford V-8 Trucks are the finest Ford has ever built.

Here is the widest range of types and sizes in all Ford history. The big 134-inch and 157-inch wheelbase Ford V-8 Trucks are designed to do the work of heavier, more expensive units—and do it faster, at lower cost. An entirely new line of 122-inch wheelbase one-ton trucks has been added to bridge the gap between the larger trucks and the new 112-inch wheelbase commercial cars. For practically every hauling and delivery requirement there is now a unit that gives the high Ford standard of dependability and economy!

The 1938 line of trucks and commercial cars are all newly styled. They have an impressive new front end, a sturdy new grille, new headlamps, massive full-skirted fenders. Their smart, modern appearance is a definite asset to any business.

Other important advances for 1938 are a new 134-inch wheelbase in the big truck line . . . a new frame width for both the 134-inch and 157-inch wheelbase units . . . 7.50—20 dual tire and wheel equipment available at extra cost . . . improved brakes and easier steering . . . stronger construction in vital parts.

The new one-tonners and the commercial cars offer a choice of the 85 or 60 horsepower V-8 engine.

Your Ford dealer invites you to see the new line—and to make an "on-the-job" test with your loads and your driver.

LOW FIRST COST IS ONLY THE START OF FORD ECONOMY

FORD'S SEVENTH YEAR OF V-8 SUCCESS

OUR FACTORY TRIP SHOWS HOW OLYMPIC PORTLAND CEMENT CO. *Increases Plant Efficiency with G-E Equipment*

For Lower Costs in 24-hour-day, Seven-day-week Operation

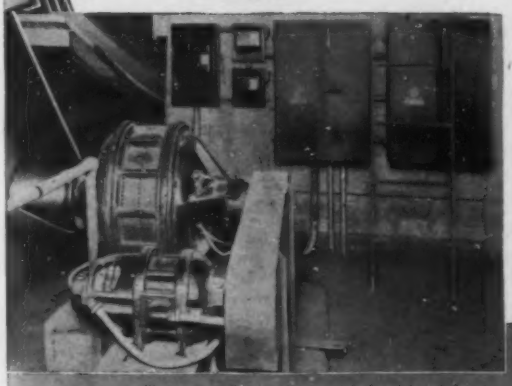
THE Olympic Portland Cement Company has been modernizing, this year. Now it is in a position to obtain even more efficient, more economical operation than heretofore in its 3000-barrel-a-day, three-kiln plant at Bellingham, Washington.

G-E power Selsyn units have been installed to keep the speed of each kiln feeder synchronized with its kiln at all times. Furthermore, three new coal pulverizers, driven by G-E motors, have been put into service. They are expected to effect an appreciable reduction in grinding costs and coal wastage.

Such progressiveness is to be expected from a company that, when it started operations in 1913, was one of the first to use the wet process to make cement from hard raw materials. From the beginning it has used G-E equipment throughout, including motors (approximately 150 in all), control, and switchgear, to help keep up a continuous production of high-quality cement—cement for roads, dams, and other great construction projects of the present day.

This equipment has given uniformly excellent service. The motors, for example, have operated for 25 years with remarkably low maintenance costs. Two of the original motors have never had a cent spent on them for maintenance—have never had "even a wrench put to them."

Such dependability is the reason for Olympic's continued confidence in G-E equipment. If you are planning to modernize your plant, here is additional evidence to show why you should select G-E equipment. Call our nearest representative for further information. General Electric Company, Schenectady, New York.

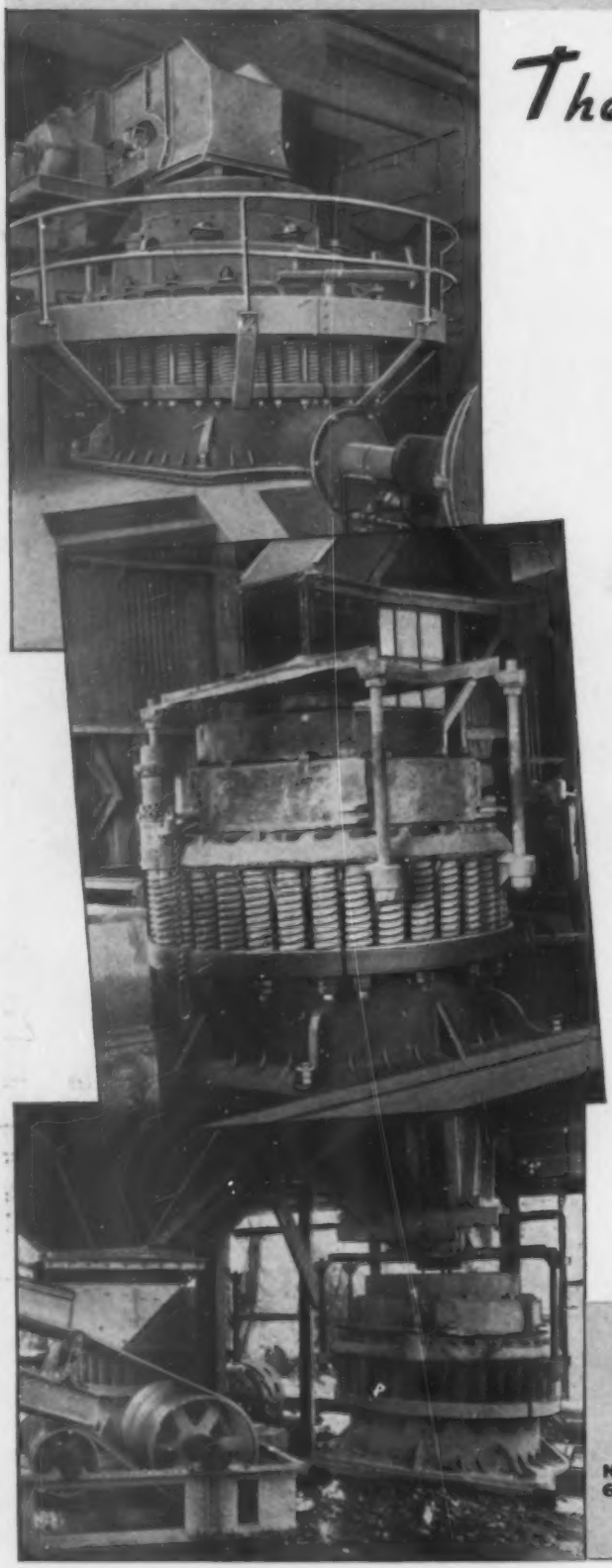


Left—G-E 50-hp, 900-rpm motor driving one of the three kilns, and G-E power Selsyn transmitter for synchronizing speed of slurry feeder with kiln

E L E C T R I C

011-198

SYMONS CONE CRUSHERS



There are reasons why

so many plants producing crushed materials are turning to Symons Cones for their fine crushing operations. With a definite trend toward the use of finer materials, many plants are handicapped in providing the required sizes in sufficient quantities and at costs in keeping with profitable operation.

The Symons Cone was developed primarily for reduction crushing. Its unusual process of crushing, its different construction, its special operating features, are all factors which combine in giving this Crusher its enormous capacity of finely crushed product. There is little wonder that it is used by leading producers throughout the world. The three installations shown in stone, slag and gravel plants are typical of the many found in the industry.

With the Symons Standard Type Cone built in seven sizes with crushing heads ranging from 20 inches to 7 feet in diameter, and the Short Head Cone in four sizes, there is a Cone for any capacity and size of product that may be desired. When confronted with a fine crushing problem, see what Nordberg has to offer in the Symons Cone.

NORDBERG
MFG. CO.
MILWAUKEE, WIS.

NEW YORK CITY
60 E. 42nd St.

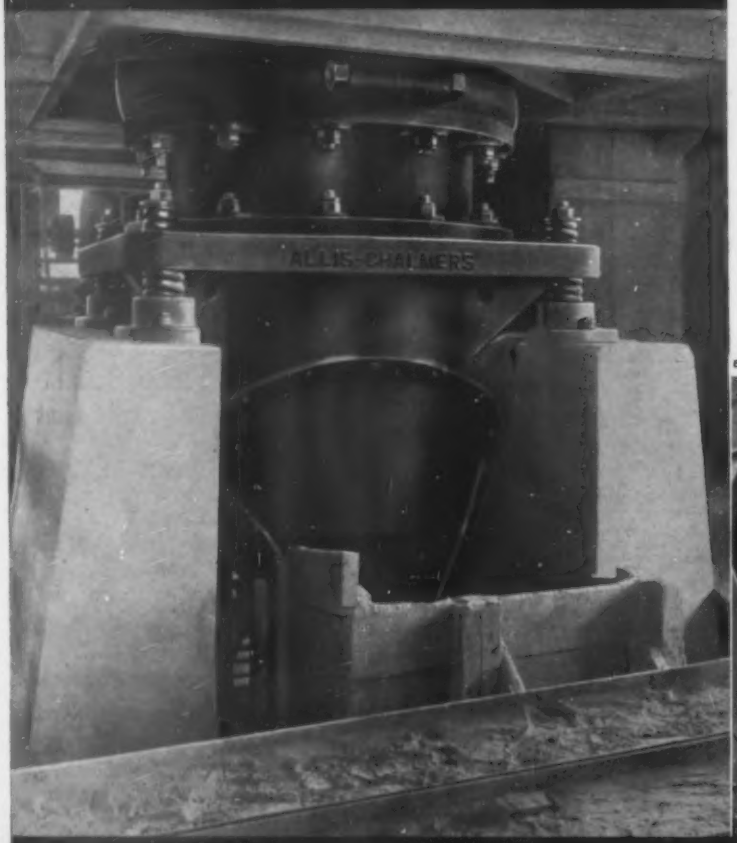
LOS ANGELES
Subway Term. Bldg.

TORONTO
Concourse Bldg.

LONDON
Bush House

MEXICO CITY
Edificio Cook

Flexible INSTALLATION

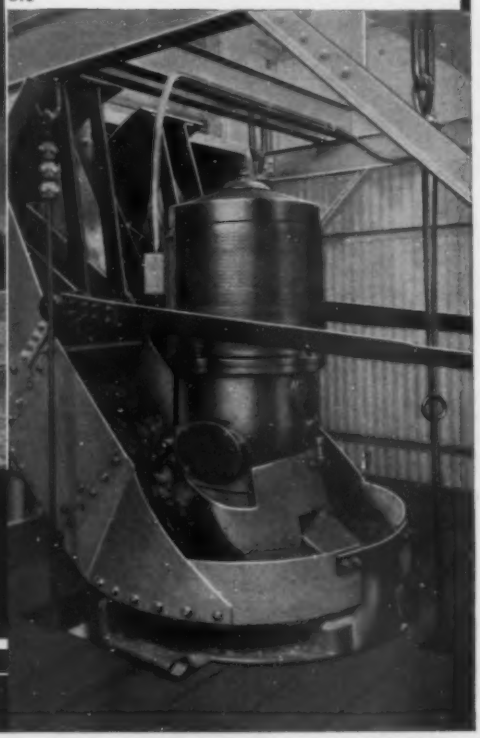


THE Newhouse is the one crusher that offers complete flexibility of installation. You can hang it from beams by means of cables or mount it on a concrete foundation with spring support, whichever works best for your plant.

OUTSTANDING FEATURES

1. Minimum number of working parts.
2. No gears and belts.
3. Minimum power requirements.
4. Large unobstructed feed opening.
5. Steep diaphragm, insuring free discharge.
6. Low oil consumption.
7. High ratio of reduction and uniform product.
8. Reversible non-choking concaves.
9. Self-contained with discharge spout, allowing crushed material to be fed direct to elevator or conveyor without additional hopper or chute. For discharging directly into bins or onto conveyor crusher can be supplied with welded steel bottom shell eliminating diaphragm and spout.
10. Large capacity.
11. Low installation cost.
12. Accessibility of moving parts.

816



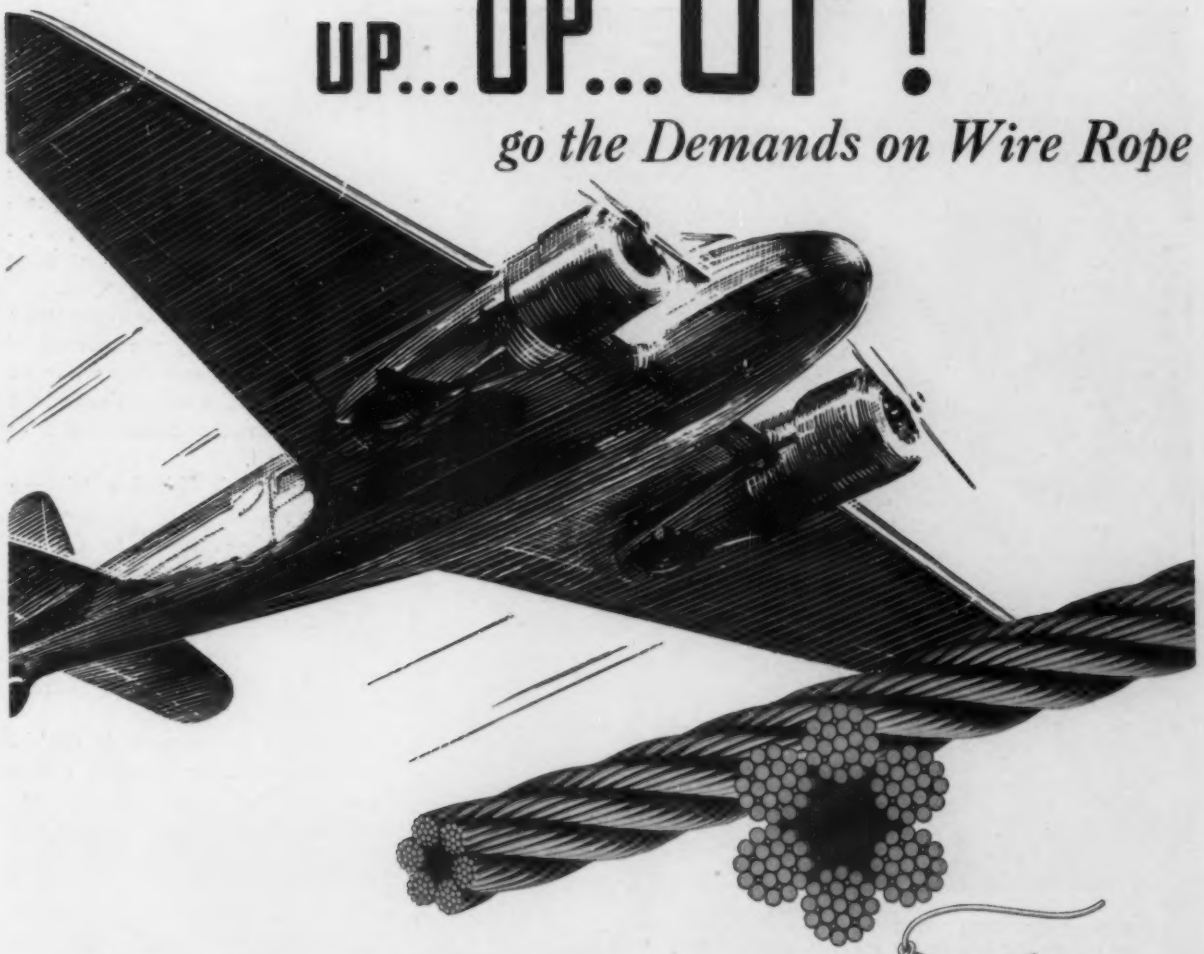
EQUIPMENT ENGINEERS TO INDUSTRY

ALLIS·CHALMERS

MILWAUKEE WISCONSIN

UP... UP... UP!

go the Demands on Wire Rope



Severest Requirements met by ROEBLING "BLUE CENTER"

To REDUCE operating costs to a minimum, it has been necessary in many instances to increase the capacity of wire rope rigged equipment. Speeds have been stepped up... loads boosted. As a result, wire rope has been called on to meet increasingly severe service.

For many applications where service conditions are severe, ROEBLING "Blue Center" WIRE ROPE has exactly met requirements. *It has proved conclusively that it assures lowest general average operating cost.*

If you are seeking a wire rope of superlative quality, one which will give you maximum safety and durability, at rock-bottom operating cost, investigate Roebling Blue Center... *the highest development in Roebling wire rope manufacture!*

JOHN A. ROEBLING'S SONS CO.
TRENTON, N. J. *Branches in Principal Cities*

ROEBLING ✸ BLUE CENTER

TRUE TO SPECIFICATIONS

LORAIN GRINDING BALLS *are regularly checked by the Brinell test for hardness. This is to assure long wear and uniform grinding action.*

OTHER LORAIN PRODUCTS Mill Liners and Screens of High Carbon Rolled Plate, Manganese, Chrome Nickel, Chrome Nickel Molybdenum, and plain Carbon Steel or Hard Iron; Hammers for Swing Hammer Mills, Industrial Cars, and Trackwork.

UNIFORMITY and economy in grinding requires balls that are *hard*—to withstand long wear in the mill . . . *resilient*—to take fast-repeating blows without splintering . . . *uniform*—to assist in maintaining the uniformity of your product.

USS Lorain Grinding Balls stand up under the heavy punishment of grinding mills because they are made exactly to specifications determined by the rough service to which they are subjected.

All USS Lorain Grinding Balls are forged to accurate size from new steel which has been rolled to definite specifications. Control of heat-treating processes, necessary for correct hardness, is effected by precise timing of movement through the cooling elements, temperatures being charted and frequently checked.

Because uniform wear is so important to efficient grinding action in your mills, we make doubly sure that USS Lorain Grinding Balls will be of uniformly high quality. From each production, samples are carefully checked in our laboratories. Measurements are made with extreme accuracy. Each production must be *as specified* . . . each production must be top quality . . . each must pass rigid tests within close tolerances—all of which guarantees greatest grinding action and long life.

USS Lorain Grinding Balls are available in the following sizes: ½", ⅝", ¾", ⅞", 1", 1¼", 1½", 2", 2½", 3", 3½", 4", 4½", and 5".

U·S·S LORAIN GRINDING BALLS

CARNEGIE-ILLINOIS STEEL CORPORATION

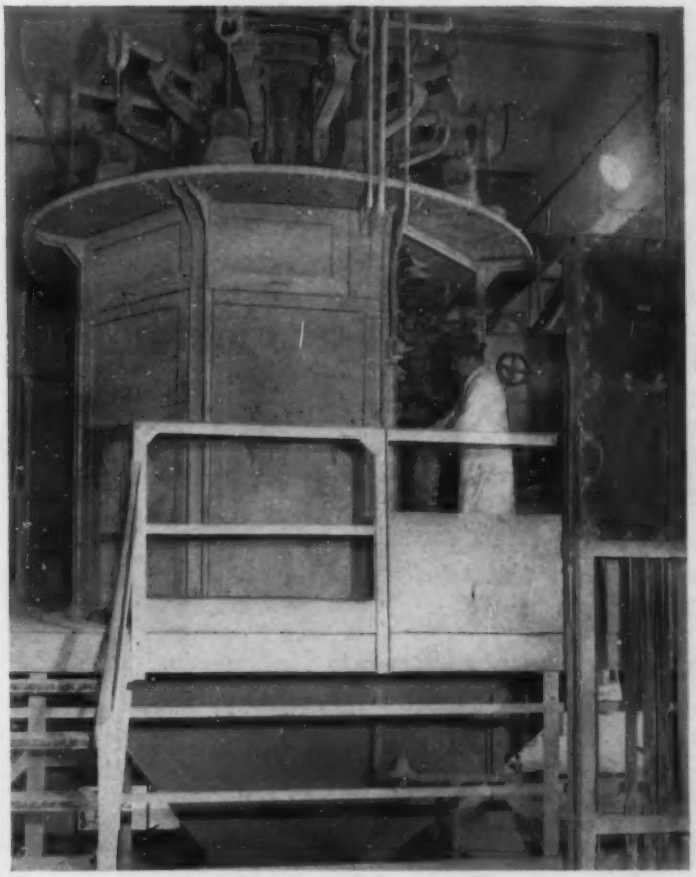
Lorain Division *Johnstown, Pa.*

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*

United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

ROTARY FLUXO PACKER



For rapid, automatic packing of cement, lime or similar material into paper or cloth valve bags.

The Rotary Fluxo Packer differs from all other types of valve bag packers. Twelve filling spouts on a rotating hopper pass before the attendant who merely applies the bags—filling, weighing and discharge are automatic. While capacities up to 2000 bags per hour, with accuracy of weighing, are easily obtained, the time allowed for filling each bag with the Fluxo Packer is considerably longer than with other types.

The capacity of the Fluxo Packer is governed entirely by the machine and not upon the skill of the attendant. Accuracy of weighing is assured as the filled bags are discharged before reaching the attendant.

The Fluxo Packer is also built with three or six spouts for smaller capacities. Additional spouts may be added as needed.

Send for Catalog

F. L. SMIDTH & CO.

225 BROADWAY NEW YORK, N. Y.

THE 21ST ANNUAL CONVENTION

of the

NATIONAL CRUSHED STONE ASSOCIATION

OFFERS TO CRUSHED STONE PRODUCERS A PROGRAM OF EXCEPTIONAL MERIT

Included among the topics scheduled for discussion are the following:

What is the Future of Private Enterprise?

Diesel Power in the Crushed Stone Industry.

The Correlation of the Los Angeles Rattler Test and Service Behavior.

Labor Relations in the Crushed Stone Industry.

Federal Wage and Hour Legislation.

Many other subjects of equal interest will appear on the program—all will be presented by men outstanding in their fields.

The Manufacturers' Division Exposition will be the largest and most comprehensive held in recent years—this feature alone well warrants attendance.

Plan now to be present at the

NETHERLAND PLAZA HOTEL

Cincinnati, Ohio

January 24, 25, and 26, 1938

for the most important event of the year to crushed stone producers.

What about Engineering Questions of the SAND AND GRAVEL AND READY MIXED CONCRETE INDUSTRIES? . . . . .

Bituminous Construction

Has the sand and gravel industry secured its share of that important market? To what types of bituminous construction are sand and gravel best adapted? What specifications should cover our further development of that field?

Deleterious Substances in Aggregates

How do deleterious substances and impurities in aggregates affect the finished product? How can they be recognized and guarded against? What do specification writers think about them?

Industrial Research

Does industrial research pay? What is the nature of the new program adopted by the National Sand and Gravel Association for carrying out imperative researches? Why should its details be familiar to every producer? What problems should be attacked first?

Railroad Ballast

What is good gravel ballast? How much of it is used? What is the attitude of the railroads toward properly prepared gravel ballast? Who writes the specifications covering its use? Will the railroad ballast market improve in 1938?

Round Table on Specifications

What is the situation in the various states as to sand and gravel specifications? What has been done locally to improve unwise and uneconomic specifications? What can individual groups do to correct the specifications which adversely affect the established industry?

What Do We Know About Concrete

Or, for that matter, what don't we know about concrete? How far has research brought us toward the point where concrete can be used most efficiently? What are the principal questions yet remaining unanswered concerning this most important material? What is being done to answer them?

Design and Control of Concrete

What is the status of that art? How important is the part played by aggregates? What can proper design and control do in the improvement of the quality of concrete?

A Ready Mixed Concrete Market

How can a company go about the job of developing markets for ready mixed concrete? What are the potentialities of different markets? Which is more effective, personal contacts, newspaper advertising, or direct mailing?

Truck Mixer Standards

How can truck mixers and agitators be used most efficiently? What has been done in the development of standards for such use? What remains to be done?

Concrete Merchandising and Servicing

What has been the experience of important companies in attacking the problems of merchandising and servicing ready mixed concrete? How have they solved the many complex problems attendant upon this relatively new business, such as delivery time, waiting time, sales based upon quality of finished product, and the like?

AND, BUT NOT IN CONCLUSION

What about such questions as: the production of sand and gravel for large projects; lime putty plants; and the many other questions of an engineering flavor now before the two industries? Not only will they be the mainspring of many personal conversations, but they will also form the subject of important addresses at the

Twenty-second Annual Convention and Exposition

NATIONAL SAND AND GRAVEL ASSOCIATION

Eighth Annual Convention and Exposition

NATIONAL READY MIXED CONCRETE ASSOCIATION

NETHERLAND PLAZA HOTEL . . . . . CINCINNATI, OHIO

JANUARY 31, FEBRUARY 1, 2 AND 3, 1938

for greater digging power

MINE operators that are using Northwest shovels have been amazed by the tremendous digging power demonstrated. Northwest machines have replaced other shovels and reduced the amount of blasting required.

Northwest shovels have unusual and exclusive advantages that make them real Rock Shovels.

The Northwest Independent Crowd utilizes forces that other shovels waste, giving extra digging power. Backed by the Northwest Welded Boom and dipper sticks and a heavy duty, slow speed engine that meets the "drag-down" loads without stalling, it offers the hard rock man a combination of features that can push a dipper through rock without a stutter and bring it up heaping every time. That means money!

You can cut ore handling costs with Northwest "extra" digging power.

Above: Northwest shovel loading ore for Canisteo Cliffs Mining Co.

In circle: Northwest Model 80 shovel. Here is the huskiest front end on any shovel, size for size.

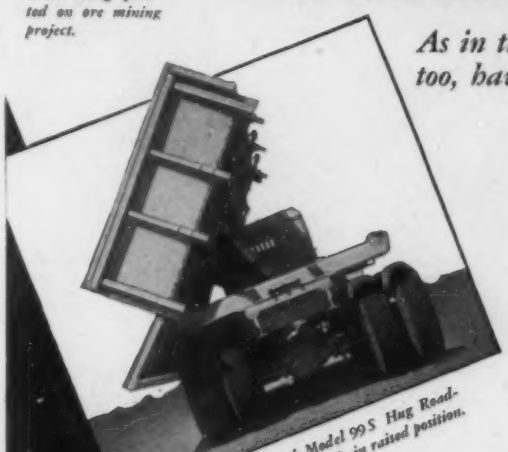
NORTHWEST ENGINEERING COMPANY
1820 Steger Building 28 East Jackson Boulevard Chicago, Illinois

NORTHWEST

HUGS are built to do a particular job Well!

Model 99 S Hug Roadbuilder delivered to Butler Bros. St. Paul, Minnesota, equipped with two-way side dump body. Truck being operated on ore mining project.

As in the case of Butler Bros. of St. Paul, Minnesota, you, too, have a particular hauling job that must be done well.



Rear view of Model 99 S Hug Roadbuilder showing body in raised position.

Side view of Model 99 S Hug Roadbuilder showing body in raised position.

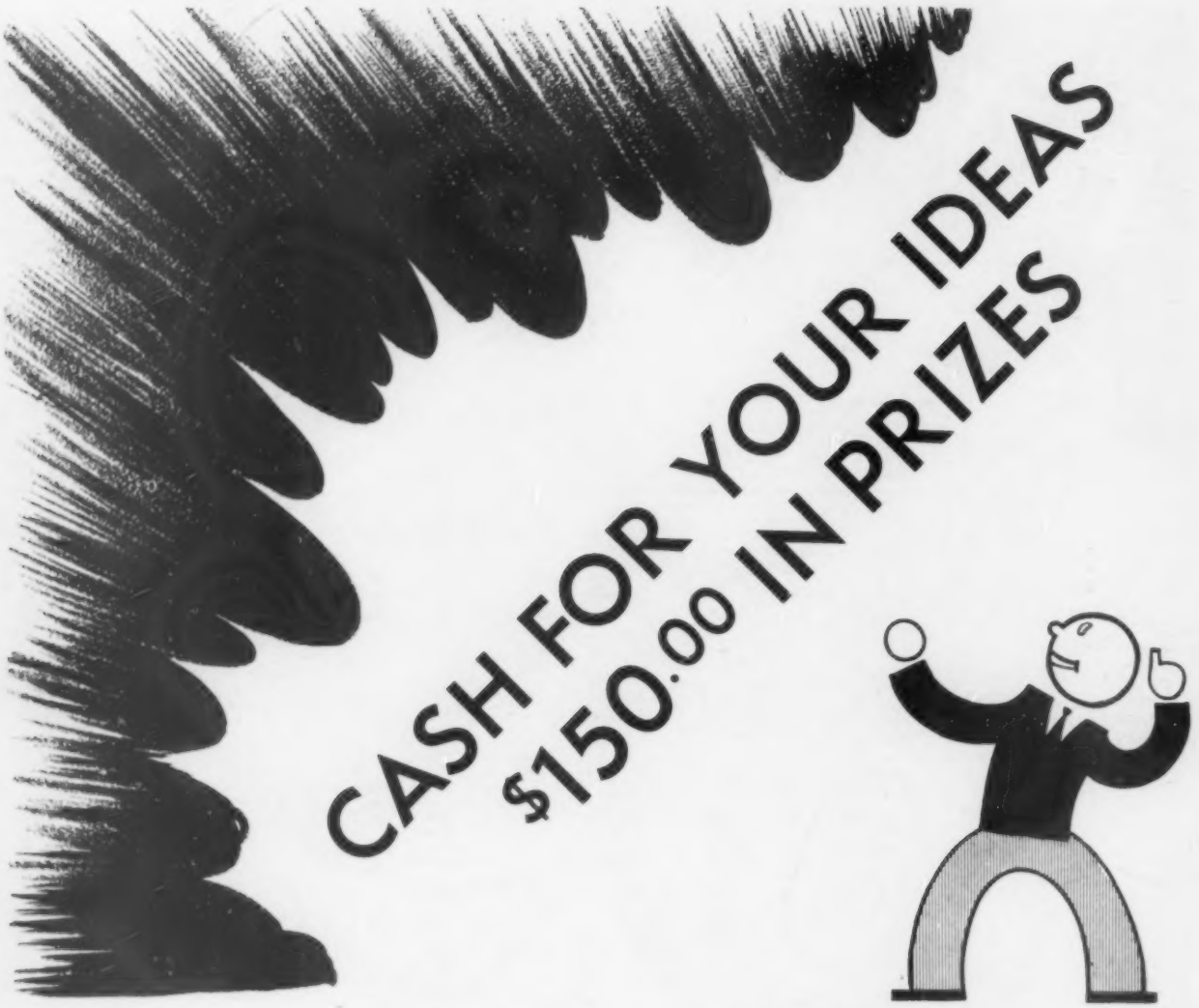
Hugs are built to fit your specific hauling problem regardless of conditions. Their electric arc welded "I" beam frames, powerful gas or Diesel truck engines with a wide range of transmission speeds, double reduction rear axle and the many other sturdy features of design in the Hug body and chassis assures you a transportation unit that will haul and keep hauling payload after payload at consistently lower hauling costs.

Hug Roadbuilder trucks are adaptable for all types of dump truck service and can be furnished with dump body equipment to meet your requirements in either rear end dump or side dump bodies. Hug bodies are built as integral units with the Hug chassis, thereby assuring proper load distribution and design.

Let Hug engineers analyze your hauling problems and furnish you with the proper transportation unit for your requirements.

HUG

The **HUG** COMPANY
706 CYPRESS ST.
HIGHLAND, ILLINOIS



It's Easy to Win

Just write down some short cut, novel operating idea or time saver which you have used in 1937. Use pen, pencil or typewriter. Tell just enough to explain your idea. If possible, illustrate with photograph, drawing or blue print. Ideas will be judged on their excellence and not on literary merit.

5 BIG PRIZES

First Prize . . $50.00 **Third Prize . . 30.00**
Second Prize . 40.00 **Fourth Prize . 20.00**
Fifth Prize . . 10.00

Any article used will be paid for. Any ideas submitted and found suitable for publication will be paid for at space rates of $5.00 per column of ROCK PRODUCTS, including illustrations.

Open to Superintendent and Plant Operating Men. Send your entry to the Editor of ROCK PRODUCTS before December 15 marked "ROCK PRODUCTS Hints and Helps Contest Entry."

ROCK PRODUCTS

205 W. Wacker Drive
CHICAGO, ILLINOIS

IS FATHER TIME HARD ON YOUR SCREENS?

DOES your screening fail in the "prime of life"... or does it go on to a ripe old age?

The life span of wire screening is based solely on the inherent toughness and stamina of the wire itself.

Wire making for the tough jobs... to meet exceptionally severe strength, vibration and abrasion requirements . . . has been Roebling's task for over 90 years.

If screen life extension is your problem, we offer you the benefit of this wire making knowledge, backed by a half century's experience in wire fabrication.

Roebling makes Wire Screening in a range of types and metals for all cleaning, grading and sizing service.

JOHN A. ROEBLING'S SONS COMPANY
TRENTON, N.J. *Branches in Principal Cities*

ROEBLING *Wire Screen*

TRADE JERSEY MARK

90 YEARS OF WIRE MAKING SPELLS THE DIFFERENCE

HOW TO HANDLE IT?

Here's the Answer!

THE LATEST INFORMATION ON THE TRANSPORTATION OF MATERIALS BY BELT CONVEYORS . . . . . .

● This catalog of belt conveyor equipment and engineering data has been developed for the convenience of the belt conveyor user and the designing engineer. It contains complete and specialized information on the design and application of belt conveyors for the handling of all bulk materials, together with full listing and description of all belt conveyor equipment.

There is also included design information and specifications for completely standardized Rex Belt Conveyors. Charts and tables are provided for quick and convenient selection of the proper unit for any particular requirement, together with dimension drawings of all units to enable engineers to incorporate such units in their material handling plant design.

Copies of this catalog may be obtained from Chain Belt district offices or by writing the Milwaukee office. When writing, please give company name and present position in your company.

MAIN OFFICE ADDRESS, 1649 W. Bruce St., Milwaukee, Wisconsin

REX

CHAIN BELT COMPANY
OF MILWAUKEE

Chain and Belt Conveying

IMPRESSIONS THAT BUILD *Confidence*

Each time a Marion moves forward, it means, the very thing for which it was designed has been accomplished . . . . maximum yardage at the lowest unit operating cost. It means sturdy construction has been combined with such desirable features as enclosed non-clogging crawlers, manganese steel shoes . . . "live" roller circle for even load distribution . . . simplified yet positive control, including steering from operator's station . . . plenty of reserve power . . . and proven performance. Buy with confidence . . . Buy a Marion. » » »

MARION'S INTERMEDIATE-SIZE EXCAVATORS

4101

4121 **4161**

There is a Marion of the right size and capacity to master every material handling job. Write for bulletin.

The MARION

STEAM SHOVEL COMPANY • MARION, OHIO

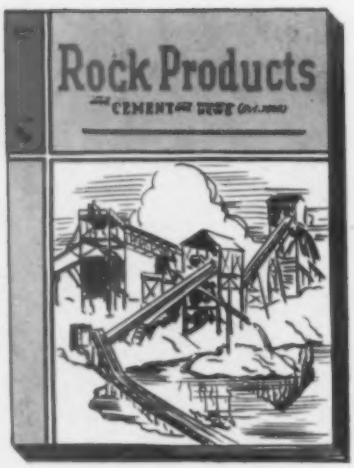
STOP!

Have you reserved space for the

ANNUAL ILLUSTRATED REVIEW AND DIRECTORY NUMBER?

A comprehensive summary of all recent improvements in processing in the rock products industry plus a preview of the annual conventions of the National Crushed Stone Association, National Sand & Gravel Association, National Ready Mixed Concrete Association and American Road Builders Association. And in addition a complete DIRECTORY of all the manufacturers who make the machinery, equipment and supplies used in the industrial minerals field.

The most powerful advertising medium yet devised for the rock products industry and at regular rates.



Forms close December 24th. Make your reservations early for choice positions. For a full year your copy in this issue will be selling your equipment.

For further details write

ROCK PRODUCTS

205 W. WACKER DRIVE CHICAGO, ILL.

The Columbia Quarry Company's Plant in Krause, Illinois — General Offices, St. Louis, Missouri.

Power under 1c per KWH and $2500 per month in direct savings. Is it worth considering? The Columbia Quarry Co. thinks it is.

Mr. E. J. Krause, President of the Columbia Quarry Co., says there are many other savings which do not show on the books. He means through higher production and lowered maintenance of plant electrical equipment which is now possible with absolutely uniform voltage. This is worth several hundred dollars more per month.

Is it any wonder this Company uses two more Superior Diesels at Valmeyer Illinois?

Superior DIESELS

HEAVY DUTY MODELS: 50 to 810 H.P., 250 to 720 R. P. M.

HIGH SPEED MODELS: 15 to 150 H.P., 900 to 1800 R. P. M.

THE NATIONAL SUPPLY COMPANY . . . SUPERIOR ENGINE DIVISION

FACTORIES AND GENERAL OFFICES: Springfield, Ohio; Philadelphia, Pa. · SALES OFFICES: New York; Chicago; Los Angeles; Houston; Jacksonville.

Control DUST FOG FUME MIST

Cover The Full Range—From Coarse to Fines—From Fines to Fume . . . .

Equipment installed by Western Precipitation Corporation provides for the control of every phase of the dust and fume problem. Given a specific condition, or a combination of conditions, equipment that is exactly correct and free from approximations can be designed and installed, resulting in maximum efficiency and economy.

IMPAX SEPARATOR

This is a simple device for separating coarse particles from fine dust. Where either the coarse or fines are valuable separately, an Impax Separator automatically delivers the coarse in one hopper and passes the fines for collection in Multiclones or Precipitators. No moving parts. Impax Separators are successfully used where there are crushing, grinding or screening operations. Having a frictional resistance of only a fraction of an inch of water, Impax Separators can be applied to existing hog fuel installations for the removal of cinders, thereby minimizing abrasion and maintenance expense on induced draft fans.

MULTICLONES

Multiclones are assemblies of individual small tube collectors arranged in parallel to provide any desired capacity. They will show extremely high efficiency in collecting particles down to the lower micron brackets. Preceded by an Impax Separator, gases containing both coarse and fine particles can be thoroughly cleaned, and the separation is automatic. Multiclones render excellent service because of their simplicity, flexibility in capacity, low draft losses, freedom from fire hazards and their initial economy. The illustration shows an Impax Separator in combination with a Multiclone.

COTTRELLS

Cottrell Electrical Precipitators are internationally admitted to be the most efficient and most versatile type of equipment for the collection of dust, fog, fume and mist. They operate at temperatures as high as 1400° F., handling acid or alkaline gases, and can be built to show efficiencies to 99.99%, according to the separation requirements. Capacities range from a few c.f.m. to 2,500,000 c.f.m. or over. Cottrells are used in nonferrous industries, iron blast furnaces, electric furnaces, powdered fuel plants, cement mills, paper mills, sulphuric acid plants, and can be adapted for any problem of dust, fog, fume or mist control.

Exclusive specialization on dust and fume problems for more than thirty-one years, with constant research and progressive engineering development, is a guaranty of the prompt and intelligent application of equipment that will most adequately and economically meet any condition arising from the necessity of abating a nuisance or recovering values, or both. Send for Bulletins.

WESTERN PRECIPITATION CORPORATION

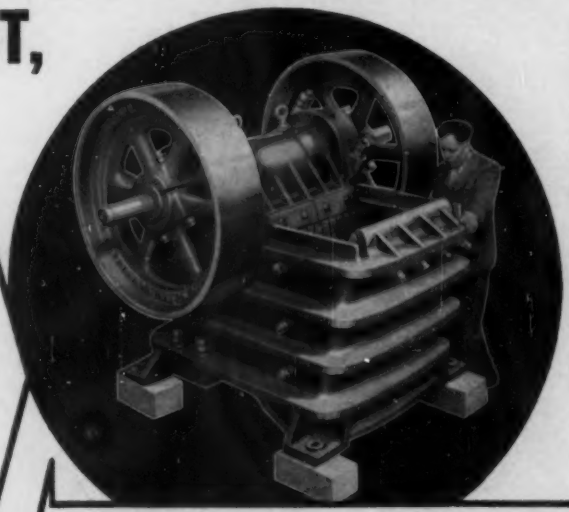
1016 West Ninth Street, Los Angeles, California • • New York, N. Y.

PRECIPITATION COMPANY OF CANADA, LTD., Montreal

TELSMITH

LONG LIFE, LOW UP-KEEP EQUIPMENT

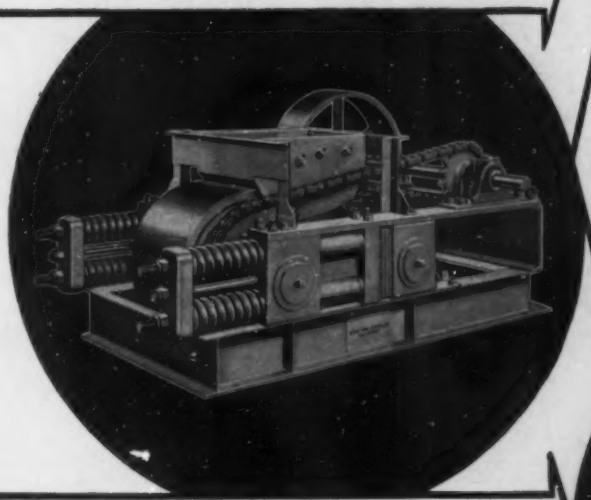
BETTERS THE PRODUCT, LOWERS THE COST



TELSMITH - WHEELING JAW CRUSHER

This super-strong, all-steel force feed jaw crusher gives greater reduction in one process than any other type of breaker. Cylindrical roller bearings and higher speed almost double capacity without any greater expenditure for power. Two toggle settings and simple adjustment allow wide range of product sizing. Made in seven sizes. *Write for Bulletin W-11.*

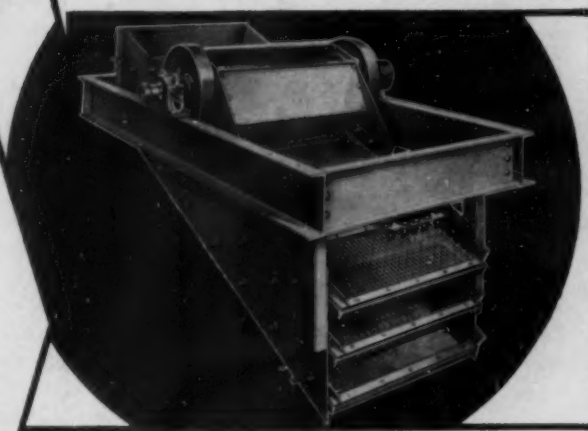
FOR COARSE CRUSHING



TELSMITH DOUBLE ROLL CRUSHER

Telsmith's latest contribution to secondary crushing is this double roll crusher, designed for quantity production of fine aggregate at moderate reduction ratios. The Telsmith Roll Crusher requires little headroom and is economical in first cost. Anti-friction bearings running in oil and spring release insure continuous operation free of break-downs. *Write for Bulletin L-11.*

FOR SECONDARY CRUSHING



TELSMITH PULSATOR

This heavy-duty vibrating screen handles sand, gravel, crushed rock, ore or coal *efficiently*, wet or dry. Maximum screening action, uniform on every inch of wire, on every deck, under any load. Anti-friction bearings and special sealing devices to protect working parts insure long life and low up-keep. Made in eleven sizes in single, double, or triple deck. *Write for Bulletin V-11.*

FOR UNIFORM SCREENING

Associates in Canada: Canadian Ingersoll-Rand Co., Ltd., Montreal, Toronto, Winnipeg, Vancouver

50 Church Street, New York City
201 N. Wells, Chicago, Ill.
1013 Commercial Trust Bldg., Philadelphia, Pa.
81 Binney St., Cambridge, Mass.
412 Westinghouse Bldg., Pittsburgh, Pa.
Brandeis M. & S. Co., Louisville, Ky.

M-7

SMITH ENGINEERING WORKS, 508 E. CAPITOL DRIVE, MILWAUKEE, WIS.

ROBINS CONVEYORS

ROBINS MAKES

Belt Conveyors and all their accessories, Belts, Idlers, Belt Trainers, Trippers, Bucket Elevators, Screens, Screen Cloth, Feeders, Gates, Mead-Morrison Hoists and Grab Buckets and complete plants.

●

Advantages of Robins design and construction are equally applicable to the small as to the large plant.

MATERIAL HANDLING ROBINS EQUIPMENT

ROBINS CONVEYING BELT COMPANY

15 Park Row, New York, N. Y.

Send for bulletins of interest to you.

Rock Products

Vol. 40 Chicago, December, 1937 No. 12

Balance Prices and Wages to Stimulate Demand

THE PRESIDENT seems genuinely concerned about the slowing down of the incipient prosperity boom, which a few short months ago he was claiming as his very own. He seems to understand that somehow or other the construction industry is the keystone in the prosperity picture. He openly and frankly recognizes that too rapidly rising costs check private building and construction. He selects one element in construction costs—the price of materials—and has instructed the Federal Trade Commission to search for evidences of monopoly and collusion. He mentions the other element in construction costs—the price of labor—and for the first time he dares take issue with organized labor in suggesting that wage rates in the building trades are too high.

Labor Cost Rises With Decreased Output

Frank honesty should compel the Federal Trade Commission to report to the President the actual facts as they are known to every builder and every producer of building materials. Briefly, they are: According to the National Industrial Board, industry's labor cost per man-hour increased 14.9 percent between July, 1936, and July, 1937; and there was no offsetting increase in productivity either on the part of labor or through mechanization of plant. The output per man-hour in July, 1937, was actually 3.7 percent below that of a year ago, so that the labor cost per unit of output rose 19.3 percent. That does not mean, of course, that no benefit was derived by mechanization or rehabilitation of plants, but merely that this was not enough to offset the decreased efficiency of labor.

While these figures are for industry as a whole it is certain that they hold true for the building material industries where the increase in volume of production in 1937 over 1936 was very little, if any, and therefore afforded little opportunity to reduce unit costs by that surest and easiest way.

Relatively Small Increase in Material Prices

Although unit labor costs increased nearly 20 percent in the year 1936 to 1937, the prices of building materials as a whole increased only between 12 and 13 percent; the price of cement increased not at all, and probably the prices of other rock products increased much less than 12 percent, if at all. However, the total increase in the cost of construction was 15 percent, again showing the predominance of the influence of labor cost—in this case increases in wage-rates for the building trades. The advisors of the President are said to have belittled this factor on the pretext that direct labor costs are but 35 percent of total building costs.

It is easily demonstrated that labor costs are by far the largest factor in the cost of any commodity. For the cost item of "materials, machinery and supplies" represents largely the labor costs of the manufacturers of these commodities; even that part of production or manufacturing cost represented by interest on plant investment, depletion and depreciation is largely a charge for labor already performed or for labor deferred. The only items of cost in commodities not chargeable to labor are administrative (including sales) cost and profit to the producer—and these usually represent but a small percentage of total unit price. One must conclude, therefore, if he is intellectually honest, that there has been a conscientious, and partly successful, effort by building material producers to keep prices down in spite of rapidly rising costs, not merely as represented by higher wages, but by increased tax costs such as the federal social security tax, state sales taxes, etc. Our own observation is that most rock products producers have done their utmost to keep prices down.

The President is actually doing organized labor a real, although doubtless a thankless, service in thus driving home the simple economic fact that it is standing in its own path of progress. Building material manufacturers have endeavored to keep prices down because they know from experience (even if their knowledge of economics is faulty) that the surest way to nip a building boom in the making is to advance prices faster than the public "can take it." They *had* to put *their* hope of profit in an increased volume.

Labor and Employer Problem Is Similar

The real goal of labor, as it is of every one engaged in production, is the largest possible aggregate earnings based on volume multiplied by unit profit. Every producer and manufacturer knows that the surest way is to increase volume; they know that to increase unit profit on a falling volume is impossible, except by methods contrary to the laws of economics, and these never succeed except for very limited periods. They can increase unit profit and volume at the same time, if it is a sellers' market, but with less than 50 percent of plant capacity utilized there has been small chance of a sellers' market.

Nor can labor increase wages too rapidly, or in the face of a falling or static market. Its maximum earnings are based on volume (or length of employment) multiplied by wage rate. It can increase wage rates when the volume of employment is growing to the limit of supply, just as the producer can then increase prices until such increases result in stopping further increases in demand for volume. Always there is a temporary balance between volume and unit price, or between employment and wage rate, in particular instances, which stimulate business; and it should be the duty of the government, if it seeks to be a factor in economic planning, to help find it. Obviously, the government under such circumstances would be doing labor a real disservice in avoiding the issue, or by encouraging false hopes or expectations, merely to gain temporary political advantage. The President has shown real foresight.

Solving the Problem of Unemployment

We sympathize with labor because of the *insecurity* of employment; so does every employer. We believe that some way must eventually be found to guarantee a minimum number of days' employment per year. Most employers now hold up their hands in holy horror at the mere suggestion. From time immemorial they have been accustomed to taking on labor and laying it off, as suited current demand for their products. They expect labor to stick around and be ready if it is needed. They have to continue to pay interest on borrowed money and to pay taxes to the government or they lose their plants. In both ways they contribute to the support of their temporarily unemployed employes—probably in the final analysis as much as if they had kept them on the job. But by doing it so indirectly they also have to support a lot of inefficiency in government, as well as a large excess of government officials, politicians and parasites. They also get the reputation of being heartless employers. The President has injected a constructive thought when he suggests a yearly wage in the construction industry. If it could be accomplished in this industry it could in any industry.

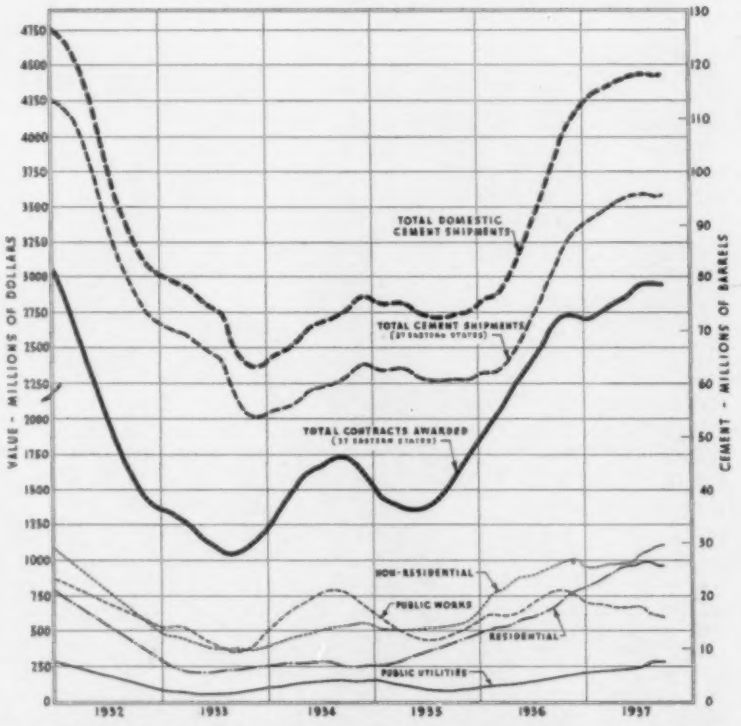
It may take a long time to work out in practice, but if all employes in industry could be put on a yearly earnings basis, we feel sure that *everyone* would be much happier and have a far greater feeling of security. Therefore, business would be much more stable and more permanently prosperous. It is, of course, difficult here to differentiate between cause and effect, but the two would go together just as surely as high wages and prosperity go together. We still have much difference of opinion as to which is the horse and which is the cart; but we do know that they go together; and so would employes' guaranteed annual earnings and business stability.

We do not believe accomplishment of this objective means a dictatorship or regimentation of industry. It means the collection and intelligent interpretation of vital business statistics—the application of economic planning by industry itself.

The great importance private building was assuming in recovery is illustrated by the accompanying chart. Up to a month ago about two-thirds of the volume (value) of contracts awarded this year was for non-residential (commercial) and residential construction. In 1934 public works accounted for about half. In other words we were at last approaching a normal and healthful condition in the construction industry, with decreasing dependence on "pump-priming" public works.

Whatever the cause, the reason for the let-up in recovery was a feeling of insecurity on the part of spenders or investors, whether they are corporations or private individuals. The cause may have been related to the stock-market collapse; but the stock market collapse was related to some cause, too. Both causes undoubtedly had their roots in fear—fear of insecurity, fear that price and wage advances were unjustified and could not be sustained.

Much hullabaloo will be directed at reviving the construction industry. Attention will be directed to many factors. Probably little attention will be directed to balancing prices and wages to stimulate demand. Yet the interests of labor in finding that happy medium are just as important as the interests of employers. Employers continuously study that phase of their industries; labor never does and probably never will unless encouraged to do so by a disinterested party. The federal government can be the disinterested party in this particular instance, and it has made a good beginning by the President's initiative. We trust it will mean the start of a thorough-going analysis and the ultimate coördination of the various branches of the construction industry.



Relation of portland cement shipments to construction—and to construction in the 37 Eastern States—and to various kinds of construction in those states

(Reproduced by courtesy of the Portland Cement Association. Figures for cement shipments from the U. S. Bureau of Mines; figures for construction in the 37 Eastern States from the Dodge Service Reports.)

Filling A Large Contract Which Must Meet Federal

SPECIFICATIONS For FINE AGGREGATES

By A. C. SCHNEIDER

Pres., The Bellevue Sand & Gravel Co.

FEDERAL SPECIFICATIONS for sand and gravel concrete aggregates have become so exacting in character that operators very often have been confronted with a difficult problem in fulfilling contracts. This is particularly true with respect to specifications covering sand, which now require considerable amounts of extreme fines.

It will be of interest therefore to learn how the Bellevue Sand and Gravel Co., Bellevue, Iowa, met this problem on a large federal contract. The deposit was opened in 1925 and is a Mississippi River bank deposit having a gravel-sand ratio of about 35:55.

Of the total sand used, the federal specification states that 95 to 100 percent by weight must pass the No. 4 sieve; 35 to 75 percent, the No. 16; 10 to 25 percent, the No. 50; and 1.5 to 7 percent, the No. 100. The problem is to get the required 100-mesh sand without falling down on the other gradations.

Methods of Obtaining Proportions of Sand Sizes

To obtain the major portion of the sand sizes required in the specification, the throughs from the lower screens in the plant (¼-in. square openings and under) are flumed to the "Rotoscoop." This machine was installed in 1934 to meet the federal requirement for sand with a fineness requirement of 10 to 25 percent passing the 50-mesh sieve, replacing cone sand collectors which gave too coarse a sand product at the capacity required in filling the contract.

With the new requirement of 1.5 to 7 percent through the 100-mesh, approximately 60-65 cu. yd. of sand is being recovered by the "Rotoscoop" in spite of a tendency for too great a percentage of fines coarser than 100-mesh. Half of the throughs from one conical screen (¼-in. square openings) bypasses the sand collecting device over a false bottom. To step up the percentage of coarser sand, one conical screen, with 3/16-in. slotted openings, has a plate below it which allows some of the 3/16-in. minus sand to go to the flume to waste without entering the "Rotoscoop." Approximately 1200 g.p.m. of water passes through the plant.

Usually on a federal contract of this

High capacity sand collecting device which de-waters federal specification sand for quick delivery into the contractor's bins. Some of the throughs from the screen on the left are by-passed to give proper gradation of sand sizes

kind, it is not always sufficient to come within the specified percentages passing a given sieve, and that is the case on this contract for sand. The engineers are adjusting the 100-mesh content of the sand to any desired percentage between the 1.5 to 7 percent requirement which is done by blending. Fortunately, a sand pocket high in fines is available on the property of the Bellevue Sand and Gravel Co. This sand tests 80 percent through the No. 50 mesh and 34 percent through the No. 100 mesh. Occasionally a truckload of this fine product is hauled to the contractor's bins where up to 15 percent is added to the mix at a time.

Part of 1750-ft. conveyor delivering sand and gravel directly from the shovel to the washing and screening plant

Meets Both Federal and State Specifications

The plant of the Bellevue Sand and Gravel Co. is located about a mile or two north of Dam No. 12, now under construction at Bellevue, Iowa, on the Mississippi River. This dam is one of several for which the company has been furnishing specification material since the federal Mississippi River program began in 1934. To date, aggregates for 83,000 cu. yd. of concrete have been produced and delivered for construction of the locks in Dam No. 12 at Bellevue, and at the same time, sand for 85,000 cu. yd. of concrete has been shipped for construction of the dam at Dubuque, Iowa. The present contract for aggregates for the lock construction at Dam No. 12 is about half completed.

Stripping is done by power shovels and excavating by a Link-Belt 40-cu. ft. electric-driven clam. Since the sand collecting device was last described (January 15, 1935, page 40 of ROCK PRODUCTS), several lengths of belt conveyor have been added, and at present 1750 ft., of belt conveyor transport the excavated sand and gravel to the top of the plant. The plant itself has not been materially redesigned, except for changes in screens for filling government contracts and the installation of the Link-Belt 12-ft. "Rotoscoop," previously mentioned. Material from the conveyors first passes over a grizzley, where the little oversize is removed, and is split in half to be screened by six Link-Belt 30½x58½x99-in. conical screens, three on each side of the plant, operating in tandem. Fines from the lower bank of screens are flumed to the "Rotoscoop" where sand is recovered.

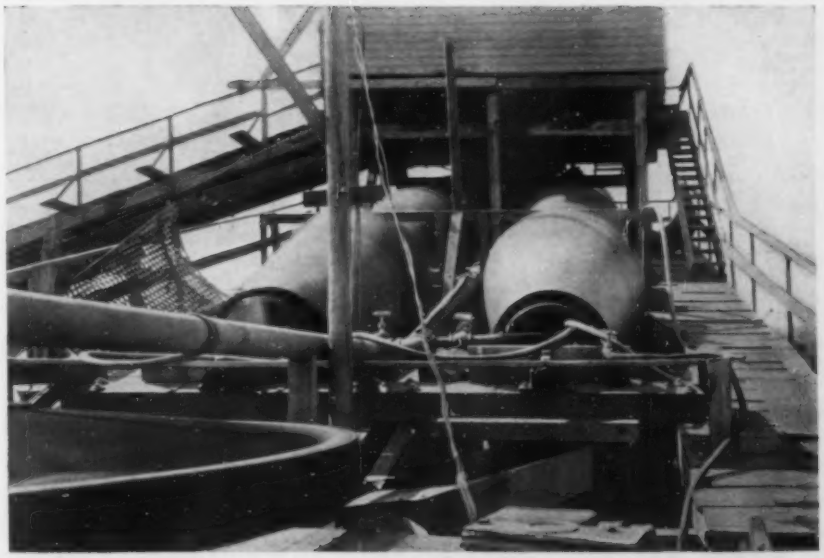
In producing gravel, the size requirements demand near capacity production to furnish the plus ¾-in. gravel in the federal specification which calls for two sizes of gravel, one ¾-in. and over in size and the other from ¼- to ¾-in. It is required that from 97 to 100 percent of the gravel pass the 1½-in. square openings, that 40 to 70 percent of the gravel pass a ¾-in. screen; and the limitation through the No. 4 screen is 0 to 6 percent for Class B concrete. With only 20 percent of the gravel in the bank comprising over ¾-in. and with 50 percent of that size gravel required to meet the specification, an over abundance of ¼- to ¾-in. gravel must be handled, which taxes the storage capacity of the plant. The small gravel bin must be kept clear so trucks are used to remove the gravel from bins to stockpile. Other outlets than federal construction will eventually absorb this over-production of small gravel.

In the present set-up, material from the deposit is passed over the grizzley, with 2½-in. square openings, and the ¾-in. to 2½-in. gravel from the first bank of screens goes to a bin. The second bank of screens has ⅜-in. square openings on one screen and ⅝-in. round openings on the other, giving a ⅜- to ¾-in. and a ⅝- to ¾-in. separation. Some of this product can be chuted to outside storage and the ¼-in. to ⅜- or ⅝-in. gravel rejects on the lower bank of screens can likewise be caught, if desired. Some of the smaller product is sold as roofing gravel.

In filling highway orders, no particular difficulty is encountered. Only one screen change is necessary since the Iowa State Highway Department has raised the requirement of 40 percent, passing the 28-mesh sieve, to 55 percent, allowing the plant to go ahead with both types of work.

Rated capacity of the plant is about 175,000 tons of sand and gravel annually, but approximately 35 to 45 cu. yd. of gravel and 60 to 65 cu. yd. of

Close up of sand collecting and de-watering device producing 65-cu. yd. per hour



Aggregates are sized through a series of conical screens, throughs from the lower screens going direct to the sand collecting device to the left

sand are being produced per hour on the present set-up.

The sand when entering the bins is sufficiently well dewatered that it can be delivered directly from the bins to the storage bins at the dam for immediate use in mixing concrete. Two additional sand bins of 35-cu. yd. capacity each were built for loading out sand into trucks, one bin being emptied while the others are being filled. Surplus sand is taken from the bins by trucks and dumped back into the deposit.

The average batches used at the dam are 1136 lb. coarse gravel, 1136 lb. fine gravel, 1001 lb. concrete sand and 172 lb. of fine sand for admixture purposes. To offset the disadvantage of only using 14 cu. yd. of gravel out of every 35 cu. yd. produced for dam construction, leaving 21 cu. yd. to be disposed of elsewhere, the plant is practically on the site of the project and can deliver direct from its bins to the contractor's bins.

One of the requirements of the plant is that the contractor must be supplied with aggregates at all times, regardless of the pouring schedule. On the Class B pouring now under way, an average of 50 to 60 cu. yd. of concrete per hour is being placed in the dam and at times as high as 800 cu. yd. is poured in a single day.

When the contract is completed and the gates are lowered to impound water back of the dam the deposit of the Bellevue Sand and Gravel Co. will be inundated and the method of operation will necessarily have to be changed.

CRYSTAL LIME CO., Orofino, Ida., has started operations with a crew of eight men at its plant near Lime Mt., 11 miles up Orofino Creek.

Reopen Iowa Quarry

LAKE-PARK HOLDING CORP., Gladbrook, Iowa, has opened its quarry at Union Grove lake, southwest of Gladbrook. The quarry is being worked for crushed stone employed in the construction of highways with WPA forces under the direction of Harry Rager, Tama County engineer. Some of the crushed rock is being hauled to Carlton township for road repairing.

Silica Firm to Double Capacity

STANDARD SILICA CORP., Ottawa, Ill., has awarded a contract for construction of a building to house a new mill and other equipment for the production of silica "flour," a sand milled to the fineness and consistency of confectioners' sugar. It is reported that a contract has been signed by the silica company disposing of the entire 1938 output of the mill to the Merchants Chemical Co. The new mill will be ready about January 1, 1938.

REORGANIZATION of the Consolidated Rock Products Co., Union Rock Co., and Consumers' Rock and Gravel Co., has been started with the presentation of a plan to the Federal Courts in Los Angeles, Calif., by the law firm of Latham, Watkins & Bouchard.

STANDARD STONE & LIME CO., Knoxville, Tenn., a company recently organized with Eastern capital and operating a quarry at the forks of the river, has applied to the City of Knoxville for the right to tap the TVA line to the Volunteer Portland Cement Co., plant.

PWA Names Regional Directors

SECRETARY ICKES has announced appointment of six of the seven regional directors to head the revised PWA field staff. In charge of projects in Maine, New Hampshire, Vermont, New York, Massachusetts, Connecticut, Rhode Island, Pennsylvania, Maryland, Delaware and New Jersey is Maurice E. Gilmore, with headquarters in New York City.

David R. Kennicott, with offices in Chicago, Ill., has jurisdiction over Wisconsin, Michigan, Illinois, Indiana, Ohio and West Virginia.

Region 3, with headquarters at Atlanta, is headed by H. T. Cole and will include Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Alabama, Mississippi and Florida.

Region 4, with headquarters at Omaha, includes Montana, Wyoming, North Dakota, South Dakota, Nebraska, Minnesota, Iowa and Missouri and is headed by R. A. Radford.

George M. Bull heads Region 5 including Colorado, New Mexico, Kansas, Oklahoma, Arkansas, Louisiana and Texas, with headquarters at Fort Worth, Texas.

At Portland, Oregon, Claude C. Hockley has supervision over Washington, Oregon and Idaho. The director chosen to head Region 6 will supervise California, Nevada, Utah and Arizona with headquarters in San Francisco.

Sand-Lime Brick Production And Shipments

THE FOLLOWING DATA are compiled from reports received direct from producers of sand-lime brick located in various parts of the United States. They may be considered representative of the industry.

Eleven active sand-lime brick plants reported for October and eleven for September, statistics for which were published in November.

Average Prices for September

Shipping Point	Plant Price	Delivered Price
Milwaukee, Wis.	$10.00	$12.50
Syracuse, N. Y.	12.00 C/L 14.00 L/C	16.00 C/L 20.00 L/C
Detroit, Mich.	——	16.00
Minneapolis, Minn.	10.00	11.50
Pontiac, Mich.	12.50	15.00
Saginaw, Mich.	10.90	——
Mishawaka, Ind.	9.25	——
Watertown, Mass.	——	12.50
Madison, Wis.	11.50	13.00

Statistics for September and October

	Sept.*	Oct.†
Production	3,811,975	2,548,875
Shipments (rail)	330,200	942,450
Shipments (truck)	3,235,349	2,377,864
Stock on hand	4,926,971	2,067,732
Unfilled orders	2,376,000	3,090,000

*Eleven plants reporting; incomplete, four not reporting unfilled orders.

†Eleven plants reporting; incomplete, five not reporting unfilled orders and four not reporting stock on hand.

Lower Costs and Increased Production Lead to

THIRD DIESEL POWER INSTALLATION

By BROR NORDBERG

AFTER SEVERAL MONTHS' SUCCESSFUL OPERATION of Diesel-generator sets at the Krause, Ill., plant, Columbia Quarry Co., St. Louis, Mo., installed similar equipment at the Valmeyer, Ill., plant. The first installation, described in ROCK PRODUCTS, October, 1936, pp. 38-40, was required to meet an emergency situation brought about when 25-cycle alternating current was discontinued by the power company.

Such marked reductions in power costs and other savings and advantages were experienced at the Krause, Ill., plant, however, that it was decided to install Diesel equipment at Valmeyer.

As operating and cost data are now available, it is of interest to review the experience with Diesel-generator equipment. There are now two Diesel engines, one of 525-hp. and the other 400-hp., manufactured by the National Supply Co. of Delaware, Superior Engine Division, which are direct-connected to Allis-Chalmers 438-kv.a. and 333-kv.a. alternating-current, 25-cycle generators, respectively.

Savings over a year's operation have been quite pronounced. As compared to purchased electrical power, the cost of generating power with Diesel equipment has actually been reduced more than one cent per kilowatt-hour based on a two cent per kilowatt-hour rate. This reduction in costs may be better appreciated when it is known that considerably over 2,000,000 kw. hr. will be generated in a year by the two power plants.

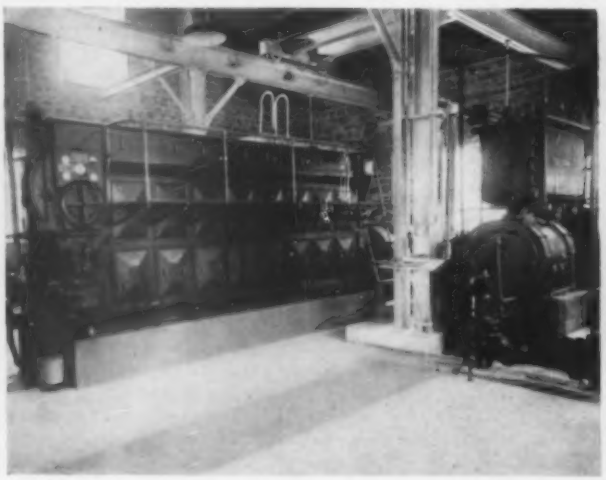
Wash water pump for washing stone; heat exchanger in the background for cooling circulating Diesel engine water

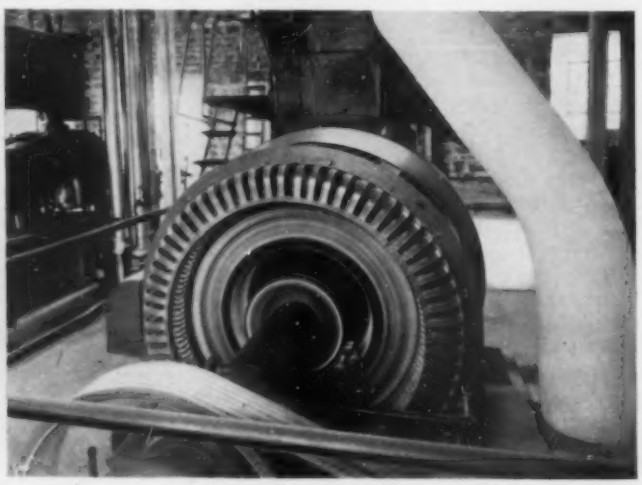
These savings are further augmented when other factors are taken into consideration. Better power characteristics with the Diesel-generator sets have been instrumental in noticeably increasing the tonnage output of the plant per hour. Repairs to individual electric motors have been reduced considerably due to the fact that a higher voltage may be maintained. The year before this installation of Diesel power it was necessary to shut down the primary crusher for a total of 38 hours during the busy production period. The crusher was full of stone, which had to be cleaned out. Only three hours were lost from this cause in the year after the Diesel engines went into operation.

Diesel-Electric Equipment In Valmeyer Plant

In the Valmeyer plant installation, a National-Superior 560-hp. 8-cyl. Diesel engine was direct-connected to an Allis-Chalmers 485-kv.a., 60 cycle, 3-phase generators. This unit went into operation in May, 1937. The Diesel engine is a type YLO with a 12½-in. bore and a 15-in. stroke, and operates at 400 r.p.m. Excitation is provided by an Allis-Chalmers direct-current 10 kw. shunt wound generator, V-belt driven at 1750 r.p.m.

In addition to the engine pumps, the Diesel engine cooling system comprises a 9x21½-ft. outside cooling tower manu-





On left: Diesel engine installation at Valmeyer plant with compressor equipment to the right. On right: Alternating current generator, direct-connected to Diesel engine

tactured by the Cooling Tower Co., New York, N. Y., a 500-gal. surge tank, water softeners manufactured by Wm. B. Scaife and Sons Co., two 4-in. centrifugal pumps, and a Sims heat exchanger.

Water is introduced into the system, usually into the basin of the cooling tower, by the 4-in. wash water pump. From this point two 4-in. Deming pumps, on a single shaft driven by a 15-hp. Robbins and Myers motor, handle both the raw and soft water. One pump forces water taken from the cooling tower through the heat exchanger where the soft water is cooled, and returns it to the cooling tower where it is spray-cooled. The same pump forces water through the water softeners to the 500-gal. surge tank through a connection to the outlet line of the pump. Soft water, after circulating through the heat exchanger, flows to the second 4-in. pump and is forced through the Diesel engine cooling system. Then this water returns to the cooler. An open line is provided from the suction end of this pipe line to the surge tank to keep a constant pressure at the pump, forcing cooling water through the engine.

Cooling water coming from the Diesel engine at a temperature of 120 deg. to 125 deg. F. is cooled between 100 and 105 deg. F., at the heat exchanger, and is reduced an additional 15 or 20 deg. F., at the cooling tower.

Fuel oil flows by gravity from a 15,000 gal. storage tank to a pump which raises the oil to a 70-gal. day tank from which it is pumped into the engine. The overflow from the day tank returns by gravity to the storage tank.

Complete instrument control of all operations of the power plant is a feature of the installation. Instruments on the panel board include: an Allis-Chalmers power factor gauge, alternating and direct-current voltmeters and ammeters, kilowatt meters, a rocking type contact regulator, and instruments for control of the size 17—10¼x12 Sullivan air compressor. Cutler-Hammer motor controls are provided throughout.

Single motor drives soft and hard water pumps for Diesel engine cooling system. The pump at the left is for soft water and the one at right is for hard water. Note water treatment tanks to the right

Fuel oil tank and water cooling tower where raw water is introduced into the system

Power house construction is of ashlar building stone quarried at the Krause plant, the structure being erected around the compressor which now stands in its original position.

The Diesel engine is started with compressed air at 250 p.s.i. by a 3⅜x1⅝x3 Curtis air compressor, V-belt driven, by a Wisconsin type AE 3x3¼-in. gasoline engine. Other machinery housed in the new power house includes: a Curtis 7x7-in. air compressor driven through a chain drive by a 20-hp. Allis-Chalmers motor, and the 4-in. Deming wash water pump driven by a G.E. 25-hp. motor.

Provisions Made For Another Diesel

Space is provided at the Valmeyer plant for installation of another Diesel engine to take care of increased load to be superimposed at a later date with the installation of new machinery. Delivery of another engine will be made in February, 1938. If this expansion materializes, a Diesel engine will be installed that can readily be moved to another site, in the event a new quarry might be opened. Some of the machinery would then be moved from Valmeyer.

At the Valmeyer plant, the normal constant plant load is 320 k.w., and in full operation 410 k.w. is furnished excluding the load imposed by the Bucyrus-Erie 32-B 1½-yd. electric shovel, with a power factor of 0.85 to 0.90. Surges in electric demand required by the shovel when the bucket digs into the stone at times superimpose a load as high as 225 k.w.

Allis-Chalmers transformers have been installed to step up the voltage from 480 to 7200 volts in transmitting electricity to the shovel ½ mile away, where it is again reduced to 480 volts.

Power plant constructed of dimension stone quarried at Columbia, Ill. Transformers, to the right, step up the voltage for transmission to the shovel in the quarry

Two Preliminary Mills Replace Eight Clinker Grinders

MODERN TWO-STAGE GRINDING

By BROR NORDBERG

FURTHER EVIDENCE of a definite trend toward modern two-stage grinding in the manufacture of portland cement is the revamping of the entire raw and finish grinding departments of the dry-process plant of the Medusa Portland Cement Co., at Dixon, Ill. The changes include air separators in closed circuit with tube mills, in both departments, to replace single-pass grinding.

Product Control

In the raw grinding department, blending bins were installed simultaneously with air separators—the entire improvement being designed for accurate control of size uniformity of the kiln feed, for constant regulation of materials in the kiln feed, and to reduce the number of tube mill operating hours.

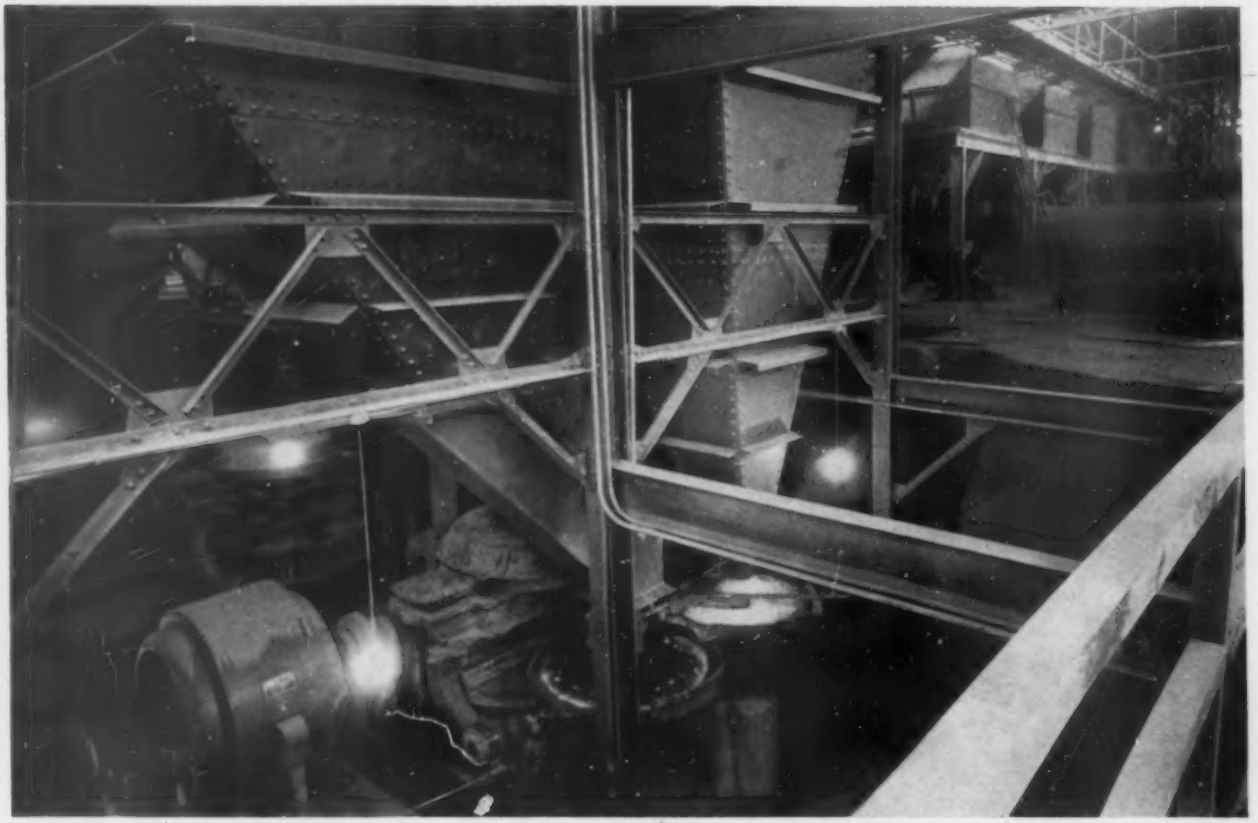
On the finishing end, outmoded preliminary grinding equipment was replaced by machinery that grinds to a degree of fineness best adapted to provide a maximum capacity in the tube mills and produce a cement of desired specific surface.

Raw Grinding

The raw grinding department is designed to produce feed for eight 8- x 100-ft. kilns of a rated daily capacity of 6000 bbl.

Before installation of air separators in 1937, stone and shale were pulverized in Williams hammer mills to a fineness of 42 to 48 percent through 20-mesh, followed by open circuit grinding in six 5- x 22-ft. tube mills and one 7- x 30-ft. three compartment mill, all of the center discharge type (Allis-Chalmers). The tube mill product, 92 to 94 percent through 200-mesh, was pumped direct to the kiln feed bins.

Three Raymond mechanical air separators were installed to reduce the total operating hours and for a positive control on the uniformity of kiln feed. The compartment mill was converted to a tube mill and closed-circuited with a



Preliminary clinker grinding equipment permits short tube mills to produce a cement of high specific surface. Clinker and gypsum are automatically fed to the mills over table feeders

16-ft. separator. Four of the smaller tube mills are operated with two 14-ft. separators as two units. One tube mill is operating in open circuit, the discharge going to the separator, the tailings from both mills being returned to the second mill of the unit. The remaining two mills are held as spares, one of which can be operated in open-circuit and the other in closed circuit.

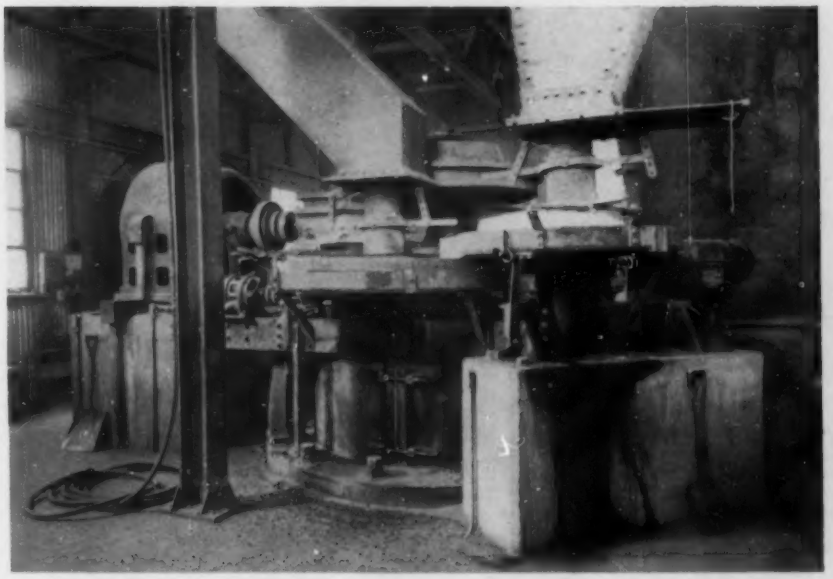
The 42 to 48 percent minus 20-mesh product from the Williams mills is stored in a 740-ton sectional bin from which it is fed to the tube mills. The 7- x 30-ft. compartment mill gets its feed from the Williams mill product through a 240-ton bin.

A No. 3 Fuller rotary feeder controls the feed from the bins to the screw conveyor serving each tube mill, and a No. 4 Fuller rotary feeder regulates the feed to the large tube mill.

An 18-in. screw conveyor and a 46-ft. 7-in. enclosed chain bucket elevator move the tube-mill discharge from the large mill to the 16-ft. separator. The separator tailings are returned to the feed end of the mill. The discharge from the four small mills is carried to two 47-ft. 2-in. elevators to the 14-ft. separators.

A 12-in. screw conveyor feeds the large mill, an 8¾-in. screw feeds the small mills, which take the tailings of the 14-ft. separators, and a 7-in. screw feeds the small mills which grind fresh material only.

Fines from the separators have a fineness practically the same as was the case in open circuit grinding, 99.3 to 99.6 percent passing 100-mesh and 91 to 94 percent passing 200-mesh. This fineness has proved to be practicable for kiln feed at this plant. The air separators are therefore operated to remove the fine particles (200-mesh) as formed.



Close-up of preliminary clinker mill which grinds as high as 175-bbl. of clinker per hour with a fineness of 52 to 54 percent through 200 mesh

The fine product is conveyed by an 18-in. screw conveyor to a Fuller-Kinyon 10-in. pump which transports it directly to new blending silos or to the kiln feed bins, in case of trouble with conveying equipment from the blending bins.

These new 15,000 bbl. concrete bins serve a double purpose; as blending bins and as a reserve storage of kiln feed in the event of a breakdown in the raw grinding department.

Stone and clay are checked for proportioning before entering the tube mills. By drawing the pulverized mixture of stone and clay from each of the four blending bins, variations in kiln feed are reduced to a minimum.

Fuller rotary feeders control the flow from the blending bins to two 14-in. screw conveyors. Conveyor discharge is transported to the kiln tanks by an 8-in. Fuller-Kinyon pump. The four blending bins are 23-ft. in diameter and 100-ft. in height.

Air separator operating in closed-circuit with two center discharge tube mills in the finish grinding department

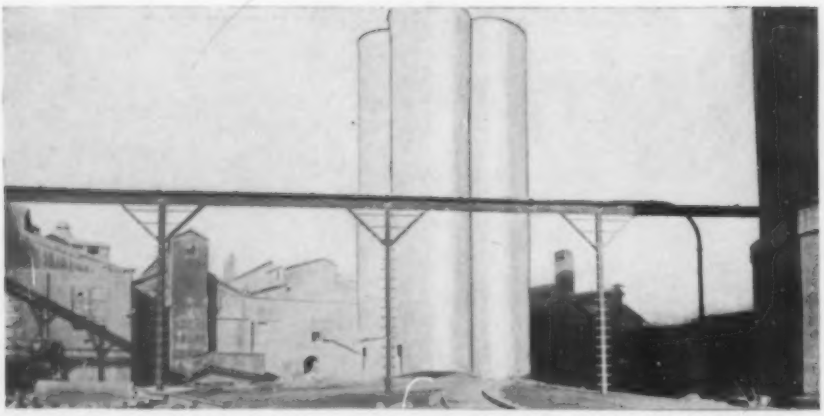
Finish Grinding

Eight preliminary clinker grinders were replaced by two Hercules mills in 1937 and four of the seven 5- x 22-ft. tube mills were closed-circuited with two 14-ft. Raymond mechanical air separators. The other three tube mills are not in operation.

With the original set-up, the preliminary grind was from 70 to 72 percent minus 20-mesh; and the seven single-pass tube mills produced a product 92 percent minus 200-mesh. This product had a specific surface of 1400 cm^2/g.

The new installation is designed to meet a specific surface requirement of 1600cm^2/g at destination or a specific surface of 1750cm^2/g at the plant to allow for agglomeration due to hydration in transit.

The tube mills are not of a large capacity and this capacity in closed-circuit grinding with air separators is dependent upon having a fine feed. The circulating load is regulated to provide enough flour (325-mesh product)



New blending bins provide adequate storage for kiln feed and are effectively used in controlling proportioning of raw materials

with a specific surface of no less than 1750cm²/g, and to keep the finish mill output equal to or in excess of the kiln production.

Clinker and gypsum are fed to each of the two Hercules mills by automatically-operated table feeders from bins having 400 tons and 40 tons capacity of clinker and gypsum, respectively.

From 150 to 175 bbl. per hour of clinker are ground to a fineness of 52 to 54 percent through 200-mesh in each Hercules mill. Practically, 100 percent passes 20-mesh and 60 to 65 percent passes 100-mesh. The mills discharge to a bucket elevator, 56-ft. centers, which in turn discharges into a 16-in. screw conveyor over the tube mill feed bins.

Two 5- x 22-ft. tube mills are closed-circuited with each separator. The feed to the mills is regulated by Fuller rotary feeders. By grinding to relative fineness in the preliminary mills, it is possible to increase the feed to each tube mill to 40 bbl. per hour as compared to 30 bbls. per hour in open-circuit, still meeting the specific surface requirement. The finished product now has a fineness of 97 to 98 percent 200-mesh and 85 to 86 percent 325-mesh. A 16-in. screw conveyor conveys the cement to an 8-in. Fuller-Kinyon pump which transports it to storage.

The Hercules mills are equipped with a Parsons No. 68 bag-type dust collector, which in addition to collecting dust has been instrumental in removing moisture liberated in the pulverizing of the gypsum.

Each of the mills is driven by a 350-hp. direct-connected, Allis-Chalmers synchronous motor.

Pennsylvania Probing Alleged Gravel Fraud

PENNSYLVANIA'S highway department gravel scandal was to be laid before the November grand jury of Erie county as a result of action instigated by Mortimer E. Graham, Erie county district attorney. The scandal concerns the sale to the state of allegedly inferior stone for road use at high prices. The state is to be required to show why contracts were not awarded to the Pioneer Materials Co., Kittanning, Penn. P. G. Baldwin, representing the gravel company, contended that he was low bidder on the 30,000 tons required on the project in question.

Cuts Production of Cement

LEHIGH PORTLAND CEMENT CO., Metaline Falls, Wash., plant, has reduced operations to the production from one kiln, with completion of the run on the 600,000-bbl. Coulee dam contract.

Limestone Company Buys Culvert Tile Plant

GOUVERNEUR LIMESTONE CO., Gouverneur, N. Y., has purchased the stock and equipment of the culvert tile manufacturing plant of the late Jos. B. Maloy. The limestone company, which has been manufacturing limestone blocks, brick, cement block, tie, and posts since 1922, will now be equipped to produce culvert tile on a much larger scale, according to Harry H. Hodgkin, president of the Gouverneur Limestone Co.

Disagree Over Land Evaluation

PIONEER MATERIALS CO., Kittaning, Penn., is holding up the sale of a 50-acre tract of land needed for construction of the Tionesta dam on the ground that the land is believed to hold valuable gravel deposits. The state had offered $3000 for the land. The gravel company suggested that an independent laboratory evaluate the land to determine an equitable price.

WPA Using Much Cement And Concrete Products

WORKS PROGRESS ADMINISTRATION, in the first 26 months of its operation up to September 1937, accounted for expenditures of $42,933,791 for cement, according to the records of the Division of Research, Statistics and Records of the WPA. This represents about one-twelfth of the nearly one-half billion dollars spent for materials, supplies and equipment on WPA projects. Of the total, the federal government contributed $31,213,369 and $11,720,422 was spent by sponsors of projects. At an average price of $2 per bbl., this expenditure represented 21,000,000 bbl. of cement or close to an average of 1,000,000 bbl. a month during the existence of WPA.

These figures do not include the total of $23,205,116 spent by WPA in the same period for concrete products. The total for concrete products represents an expenditure of $14,535,552 in federal money and $8,669,564 by sponsors of projects.

One Job!

CEMENT SHIPMENTS to the Grand Coulee dam on the Columbia river, Washington, have been stepped up to between 110,000 and 125,000 bbl. weekly.

Nearing Completion

HURON PORTLAND CEMENT CO., Detroit, Mich., has about completed its new storage and packing plant at Muskegon, Mich. The plant, it is said, will be the company's headquarters for distribution of cement in west Michigan.

Gets Permit to Lay Trackage to Plant

BOYER CEMENT BLOCK CO., Sioux City, Iowa, has been granted a city permit to lay a narrow gauge track across an alley in Felt's addition to expedite movements of its products.

Order New Cement Kiln

UNIVERSAL ATLAS CEMENT CORP., Wilkes Barre, Penn., has placed a contract with Vulcan Iron Works for a cement kiln and other equipment to cost $175,000.

RECEIPTS OF FOREIGN CEMENT in September totalled 54,762,241 lb., according to reports of the Commerce Department. This compares with 46,543,640 lb. in August and 69,752,202 lb. in September of last year.

FALL FROM BARGE DOCK

Fatal to Cement Plant Workman

A FATAL ACCIDENT occurred recently when a workman engaged in repairing a cement plant river dock fell from the deck, a distance of 22 ft., to the river bank below.

A party of five workmen were engaged in repairing the dock flooring. In order to insert a new 12-x14-in. sill (14 ft. long) under the deck floor, a portion of the flooring had been removed, leaving an opening 10- x 14-ft. in the floor. Three timbers had been placed across the opening to support the new sill as it was being moved into place, using rollers made of 2-in. pipe.

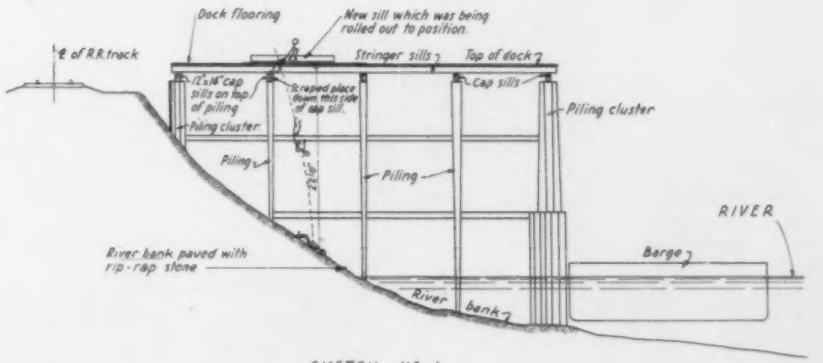
The victim of the accident was standing on the 12-in. top of a 12- x 14-in. cap sill, at right angles to the sill being placed. He stood between the new sill and the flooring which had not been removed, about 2 ft. from the former and 3 ft. from the latter. He had placed a roller under the sill, and it had been brought up to a new position and stopped. Workmen who were nearby saw the victim appear to try to take a step when he started down. He fell to the rip-rapped surface of the river bank below.

Surfaces on which the workmen walked were dry and clean, even and smooth. The victim had worked on many high jobs and seemed to prefer that kind of work. He was known to be sure-footed and careful, and had been especially selected as a safe worker. As the dock works above the deck had been entirely dismantled, there was nothing to which a safety belt might have been secured.

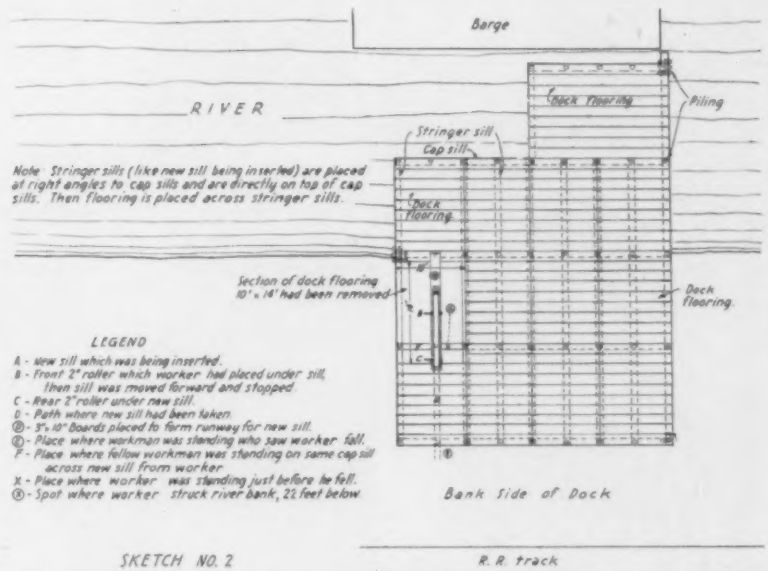
This worker, who had been with this plant 5½ years, was 54 years of age, married, and the father of one son, 12 years of age. The accident occurred at 11 a. m., in good daylight and fair weather, there being no unusually difficult circumstances. The victim died within a few hours as a result of fracture of the skull and several vertebrae.

Injuries from falls are the most common with which cement mills have to contend at the present time. This is also true of heavy industries in general. In 1936, falls of various kinds accounted for 23½ percent of all cement plant accidents, whereas the next most prolific cause of accidents accounted for only 9½ percent of the total. This will give an idea as to how important it is that falls be prevented. Frequently a high fall is not fatal or even disabling. On the contrary, many falls on the level have been fatal. The average fall from buildings and scaffolds in cement mills last year cost 80 days' lost time.

With nothing above the man to which a life line might have been attached, it would have been out of the question to have secured the man to the timbers below him because such line, to have offered real protection, would have had to be too short to permit his necessary movements. About the only practical means of protecting the man in such case might be the use of a derrick or tripod to support the life line. In this particular case, there was a stiff leg derrick on top of the dock which might have been used had it not been dismantled prior to starting repair operations.



SKETCH NO. 1



SKETCH NO. 2

Sketches showing elevation and plan of dock structure, illustrating how fatal accident probably happened and the conditions involved

Semi-Permanent Aggregates Plant Makes

EFFICIENT USE of EQUIPMENT

By F. M. WELCH

F. M. Welch Engineering Service

A TEMPORARY GRAVEL PLANT near Greenbush, Mich., was recently built by the Hersey Gravel Co., Hersey, Mich., which for its simplicity, flexibility, compactness and capacity deserves comment. The Hersey Gravel Co. is managed by William H. Allswede, the inventor of the Allswede Scrubber. In addition to its gravel interests in Hersey, Greenbush and Grand Rapids, Mich., this company is in the road contracting business on an extensive scale.

Early this year a large concrete highway construction job was let near Greenbush. Mr. Allswede was not the successful contractor, but he visioned an opportunity to build an aggregates plant adjacent to the job which would more than pay for itself before the new job was finished and which could be torn down and moved to a permanent site on a railroad in the same vicinity when the contract was completed.

As the deposit at Greenbush represented an average composition of large and fine gradations, primary and secondary crushers, screening and washing facilities were required. The highway contract required two grades of gravel and one grade of sand. Furthermore, there was an immediate demand for a considerable amount of partially crushed road maintenance gravel for the secondary roads in the vicinity.

Requirements demanded an ample storage of both fine and coarse gravel as well as sand ahead of the construction job at all times. This was accomplished by building two timber bulkheads 27 ft. high and 15 ft. apart tied together by an overhead bin about 14 ft. square. Fine gravel was stored on the ground on one side and coarse gravel on the other. The road maintenance gravel which was produced at odd times or borrowed from the contract material was stored in the bin.

Storage Bin Tied to Bulkheads for Strength

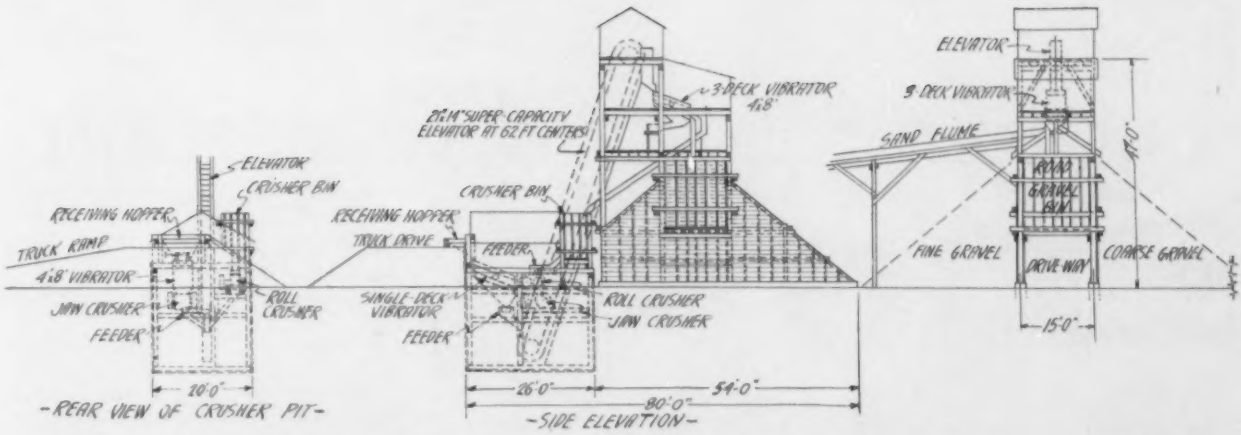
The bin acted as an ideal connection to tie the bulkheads together and to stiffen and secure the bulkheads where the pressure was the greatest. On the other hand, the bulkheads not only served as supports for the bin but formed two sides of it. The structure as a whole served to support the screening and washing equipment and the elevator head above, while trucks could drive underneath the bin for the loading of road gravel.

Sand, together with the washing water from the bottom deck of the washing screen, was flumed to a point in the yard beyond one of the gravel storage piles into a standard sand drag, set up on four posts about 20 ft. above the ground. The sand drag which, by the nature of its construction, elevates the sand about 7 ft. to its discharge, permits a ground storage pile of sand about 27 ft. high adjacent to the gravel piles. A batching bin was erected, out in front of the three storage piles of fine and coarse gravel and sand, so located that the contractor's crane operating in the intervening area could readily and efficiently keep the batch bins charged. The contractor, of course, also had his cement storage close at hand.

Plant Operation Is Not Complicated

Mechanically, the plant is as simple and efficient as the storage and reclaiming features. Gravel is transported from the deposit by trucks up a ramp and dumped into a receiving hopper, a manually operated gate controlling the flow of raw material from this hopper on to a single-deck, 4x8-ft. vibrating screen which acted as a scalper. Material passing through the scalper drops into a small hopper served by a belt feeder

Left: Sand drag set off from main plant. Center: Rear view of plant, showing elevator equipment and storage. Right: Hopper and single-deck scalping vibrator to take place of grizzley bars



Elevation views of principal plant units of Hersey Gravel Co., at Greenbush, Mich. Note arrangement of roll crusher and jaw crusher

underneath, which feeds it uniformly on to a bucket elevator extending to the top of the plant. The oversize passes directly to a jaw crusher located at one side of the elevator which takes the crusher discharges.

The elevator is a 21- x 14-in. continuous bucket, super-capacity unit mounted on two strands of steel thimble roller chain at 62-ft. centers. It is mounted on a structural steel frame with renewable chain tracks, making it a self-contained unit which can be readily moved to the new location. It discharges at the top of the plant on to a 4- x 8-ft. three-deck vibrating screen.

Oversize from the top deck of the vibrator is spouted by gravity to a 25½- x 20-in. double roll crusher, located opposite the jaw crusher on the other side of the elevator to which it discharges. This crusher is served by a small crusher bin or surge bin and apron feeder which assures an even, uniform feed.

The coarse gravel from the vibrator is spouted to ground storage on one side of the bulkheads, the small gravel to the other side, and the sand and water is flumed to the sand drag where the sand is discharged to a ground storage pile adjacent to the gravel as described above.

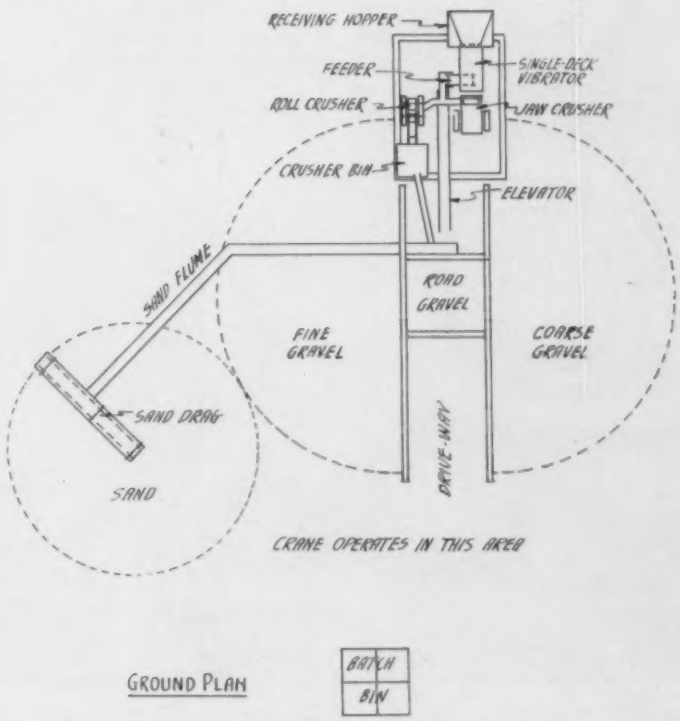
With the exception of concrete foundations under the two bulkheads, the entire structure is of timber construction. This includes the crusher and elevator pit which extends about 17 ft. below ground.

Owing to the simplicity of construction and the minimum amount of lumber and machinery, Mr. Allswede is of the opinion that with a plant which has already more than paid for itself, his only investment in a permanent plant, commercially well located, will be the cost of dismantling and moving this unit and the addition of some car loading bins.

On account of the extensive aggregate and construction interests of the Hersey Gravel Co., some of the machinery and building materials were on hand. The only new machinery purchased was a 4- x 8-ft. three-deck Selectro Jigger vibrating screen manufactured by the Productive Equipment Co., of Chicago, Ill., and the elevator, roll crusher, sand drag, the two feeders and some of the driving machinery which was furnished by the F. M. Welch Engineering Service of Greenville, Ohio. The latter company also designed the plant.

This plant and the arrangement of equipment is of particular interest at this time to many operators who are faced with the problem of providing economical facilities in filling a contract for aggregates which does justify a large investment in permanent structures.

CONCRETE PIPE AND TILE CO., Camden, Ohio, has been awarded a contract, by Preble county commissioners, for the construction work on the Van Ausdall county ditch in Israel county.



Ground plan shows location of sand drag equipment with respect to main plant

Ingenious Equipment For

ONE MAN CONTROL of STONE PLANT

From An Interview With

J. F. SCHNEIDER

Secy. and Gen. Mgr., Williams and Schneider Stone Co.

HOW MAY A SMALL OPERATOR use his ingenuity to keep operating costs and overhead expenses down to the point where he can make a profit? The answer to this question is to be found in the methods and ingenious equipment of a Missouri stone plant.

The plant is that of the Williams and Schneider Stone Co., Springfield, Mo., and the man is J. F. Schneider, secretary and general manager of the company. Mr. Schneider is always on the job, and there is nothing that needs to be done around the plant for which he cannot devise a means of accomplishing the job. A well-equipped machine shop provides the tools for putting his ideas into actual practice.

This plant was built in 1926 when the company was formed, and with the exception of six new concrete bins built in 1931 and the rearrangement of equipment attendant to such a change, no machinery has been added, yet practically any specification for crushed stone can be met which it is possible to meet with a dry screening plant.

One Man Controls the Entire Plant Operation

One man controls the operation of the entire plant, which produces from 100 to 400 tons of stone per 8-hr. day, the lower figure representing the capacity when a multiplicity of small stone sizes are being produced. Incidentally, the men employed were originally farmers and farm hands who had no previous experience in quarry and stone operation, but they have "stuck" and have learned their respective duties so well that practically no supervision is needed and none, as such, is given. As Mr. Schneider puts it, "I help the boys whenever and wherever they need me. The crew has been on the job since the plant was established, and a great deal of credit is due to these men for their co-operation."

Being a one-man supervised plant, the quarry operation is so arranged that delivery of the rock to the primary crusher will not require the services of any other employes "on top". The 35-ft. face of stone is drilled in the conventional well-drill manner, and a ⅝-cu. yd. Thew steam shovel loads 1½-tons of stone into two International end-dump trucks. The trucks back up a grade at the foot of the incline to the plant, and discharge to a home-made 2-ton side dump quarry car.

A home-made, single drum hoist is used in pulling the quarry car up the incline out of the quarry over 30-in. gauge track to the operator's floor above the primary crusher. The operator has a clear view of the entire quarry, the movements of the trucks as they come loaded from the shovel, all crushing equipment, and in fact every piece of machinery except the final sizing screens. These screens are on the floor above, and can be stopped on a moment's notice by the operator who has push-button switches at his side.

Unique Method of Dumping Quarry Cars

The method of dumping rock into the Telsmith 13A (60-ton rated capacity per hour) primary crusher is unique, and is instrumental in keeping costs down in producing a clean stone product without washing. Usually, in a small stone plant, the quarry car load is dumped completely into the crusher with any dirt that it might contain and without any thought to the "hanging up" of stone too large for the crusher to handle.

This is the "bottle neck" in many small plants where two or three men

Left: Stone is transferred from trucks to cars for delivery to the crusher. Right: Air-operated lift for controlling the dumping of stone into crusher. Apron slope designed to retain foreign material as stone passes into the crusher

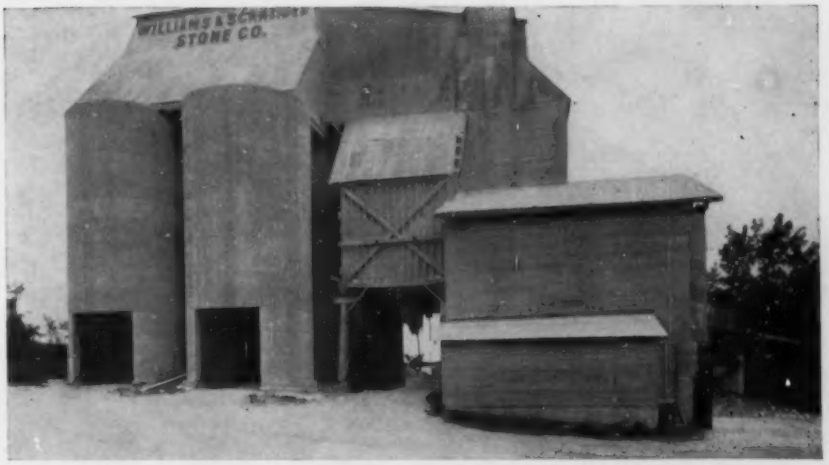
feverishly pound away at the large rock to loosen the jam of material. Controlling the dumping of the quarry cars is the "keystone" of operation in this plant.

At the dumping point the loaded quarry car is stopped and a brake set against the rear axle of the car by a foot pedal at the operator's station. The brake consists of a piece of timber which is raised from below the tracks by a system of levers.

When the quarry car is stopped by the brake it is dumped by a hydraulic lift or hoist mounted on the side of the track opposite the crusher. The hoist, which is made from a piece of 8-in. dredge pipe, has a 2½-in. diameter piston, operated by compressed air at 90 p.s.i. from the compressed air plant.

When at rest, the lift is in a vertical position; when placed in action by the operator's lever, the lift tilts toward the upper edge of the quarry car, and the piston, the end of which is slotted, extends to engage the edge of the quarry car. Further extension of the piston pushes the car into a dumping position. The car can be tilted at any angle to retard the flow of rock to the crusher, it may be dumped completely in one movement or it can be shaken, all at a touch of the operator's finger. Springs return the lift to its original position.

Rock does not fall directly into the crusher opening but rolls over a steel incline chute set at about 30 deg. to the horizontal. The upper ledge of rock in this quarry often contains soil in its crevices which has been washed down by rains. By slowly emptying the quarry car, this moist material will be retained on the inclined chute and the plant operator shovels it out of the chute between loads. Care is taken in loading the cars in the quarry so that the larger stone will be on top in the quarry cars. This practice is instrumental in keeping dust in sized stone below the two percent allowed by state specifications. None of the stone is washed.

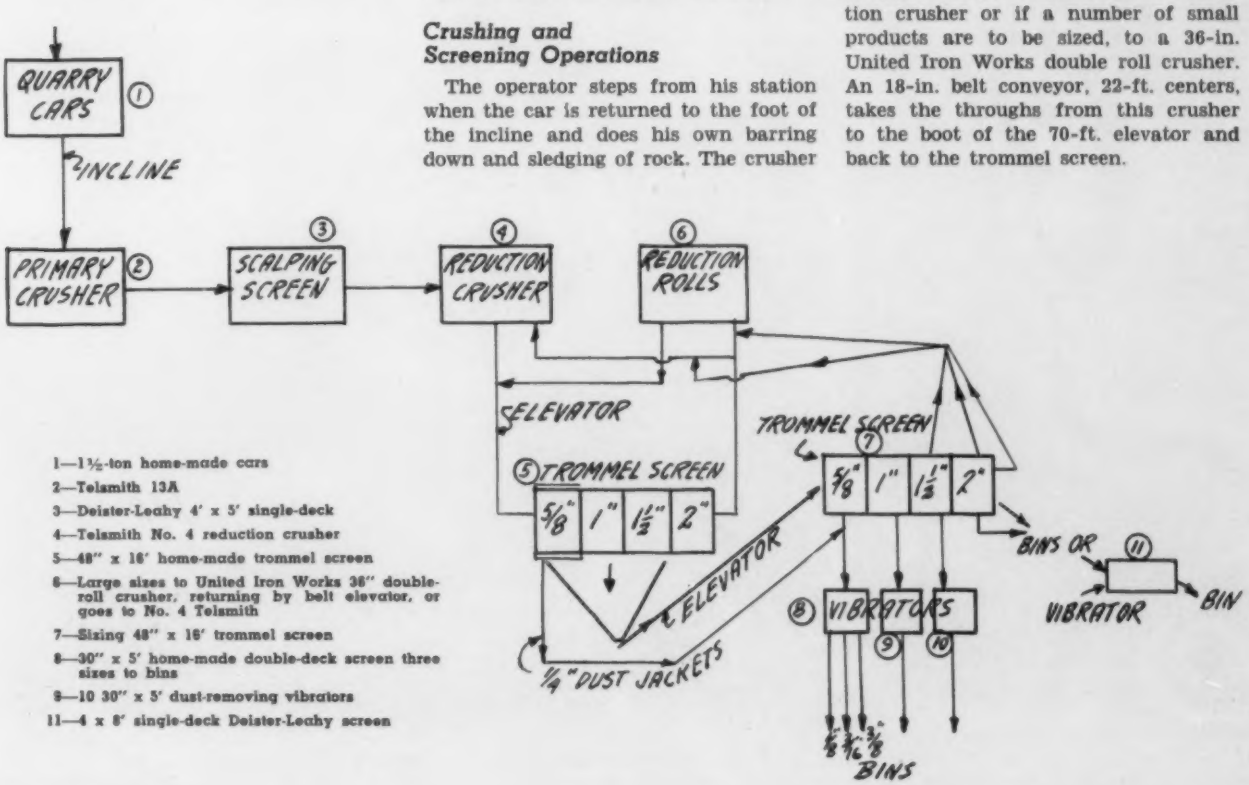


Concrete bins of unusual design were constructed. Extra bin gates were provided for cleaning out the stone storage bins

Crushing and Screening Operations

The operator steps from his station when the car is returned to the foot of the incline and does his own barring down and sledging of rock. The crusher discharge passes directly over a 4- x 5-ft. Deister - Leahy vibrating single-deck scalping screen, the plus 4-in. stone passing direct to a Telsmith No. 4 reduction crusher. Throughs from the crusher are elevated by a home-made bucket elevator, 70-ft. centers, to a 48-in. by 16-ft. home-made trommel screen having 5-, 5-, 3- and 3-ft. sections with ⅝-, 1-, 1½- and 2-in. round openings, respectively. The screen has a 60-in. by 4-ft. dust jacket.

This screen serves as a second scalping screen, and any of the larger sizes of stone can be returned to the reduction crusher or if a number of small products are to be sized, to a 36-in. United Iron Works double roll crusher. An 18-in. belt conveyor, 22-ft. centers, takes the throughs from this crusher to the boot of the 70-ft. elevator and back to the trommel screen.



1—1½-ton home-made cars
2—Telsmith 13A
3—Deister-Leahy 4' x 5' single-deck
4—Telsmith No. 4 reduction crusher
5—48" x 16' home-made trommel screen
6—Large sizes to United Iron Works 36" double-roll crusher, returning by belt elevator, or goes to No. 4 Telsmith
7—Sizing 48" x 16' trommel screen
8—30" x 5' home-made double-deck screen three sizes to bins
9—10 30" x 5' dust-removing vibrators
11—4 x 8' single-deck Deister-Leahy screen

Another bucket elevator carries the sizes of stone not returned from the trommel screen to a second trommel screen, identical in size and screen openings. The 2-in. stone goes direct to bins, and the $\frac{5}{8}$- to 0-in., 1-in., and $1\frac{1}{2}$-in. stone each pass over a separate 30-in. by 5-ft. vibrating screen. The 1-in. and $1\frac{1}{2}$-in. stone is passed over the screens (3/16-in. openings) merely to remove dust before passing to bins. The dust goes over a belt conveyor, to a dust bin, to be sold as agstone.

The minus $\frac{5}{8}$-in. stone passes over a double-deck vibrating screen, with 3/16-in. and $\frac{1}{8}$-in. square openings, for further separation. Oversize stone is used for finished black top paving, the $\frac{1}{8}$- to 3/16-in. (No. 0) product is sold for the same purpose and for chicken grits, while the $\frac{1}{8}$-in. to dust products (No. 00) is used as filler, as agstone and for plastering. To transfer the No. 0 material to its proper bin (not below), a short 4-in. spiral conveyor takes the stone as it comes from the screen cloth and discharges to a 6-in. cross belt conveyor which in turn discharges to a bin.

When producing highway specification coarse gravel, the stone is passed over a Deister-Leahy 4- x 8-ft. vibrating screen for removal of dust. In 1931, six new concrete bins of 1200-ton capacity were built, using silo forms. Three gates under each bin are used to fill trucks, and two additional gates are provided for cleaning out the bins in the event a specification requires that the bins be empty before production on a particular contract be started. The No. 0 and No. 00 products are stored in 25-ton bins in the old structure.

A 75-hp. General Electric slip ring motor drives all equipment in the plant, except the two reduction crushers, which are driven by a 40-hp. G. E. motor. Starting buttons for both motors are at the operator's station, where he can quickly shut down the plant should a belt come off the pulley or some mechanical difficulty occur. To save steps on the part of the workmen the 4-in. American Type E pump for draining the quarry from a sump is automatically started and stopped by a float actuating a switch. The pump handles 500 g.p.m., and starts and stops with a two-foot difference in elevation of the water level in the sump. The pump is driven by a 15-hp. G. E. motor.

MANEGOLD STONE CO., Milwaukee, Wis., recently lowered three heavy trucks 136 ft. into its quarry in Milwaukee. These trucks, which replace old quarry cars operating over industrial track, will be left in the quarry until they fall apart, since the expense of hoisting them back is too great.

Vacuum Concrete Process Applied to Concrete Vaults

DURING THE RECENT OHIO STATE Concrete Burial Vault Manufacturers Association convention at Columbus, Ohio, a demonstration of the vacuum concrete process was held at the Engineering Experimental Station of Ohio State University. Results obtained were satisfactory, and should be of interest to manufacturers of concrete products and all others employing every form of concrete construction.

The process, as developed by K. P. Billner, New York, N. Y., holds particular interest to the concrete burial vault industry, in which each manufacturer is continually striving for greater density and watertightness to insure many years of service after the vault is placed underground. The vault industry is experimenting with vibrators and other means of placing concrete in which the amount of water in the mix is reduced to a minimum.

In the vacuum concrete process, the problem of water-ratio is treated from an entirely different angle than before. With this process only enough mixing water needed to properly place the concrete in the forms is used. Vacuum pads are applied to the forms before placing the concrete, the mats are connected with a vacuum pump and the excess water is drawn off, giving the same effect as if the minimum amount of water for proper hydration of the cement had been originally placed in the mix. The vacuum set up within the concrete creates a pressure on the outside of the form which helps to compact the concrete, while at the same time it produces a mechanical hardness which enables immediate stripping of the forms.

In the demonstration at Columbus, W. F. Lockhardt, vice-president of the Vacuum Concrete Corp., New York, N. Y., supervised the test. In this case, a slab about 2-in. thick, 24-in. wide and 7 ft. in length was poured with a concrete of 8- to 10-in. slump. The vacuum was applied to the concrete for ten minutes. One form was then stripped off, and a 200-lb. man walked on the concrete without leaving a footprint, giving a good idea of the compactness of the mix after withdrawing the excess water by the vacuum process.

Rock Wool

IOWA GEOLOGICAL SURVEY field men are scouring the state for deposits of limestone containing shale for crude material for manufacture of rock wool. A. O. Trowbridge, state geologist, said the search is being made near important trade centers where manufacture of insulating products will have the advantages of better transportation facilities, larger supply of labor and abundance of coal and coke. Iowa is one of the few states producing rock wool from shaley limestone base. The principal factory is at Dubuque.

Buy Phosphate Rock Property

C. B. HAYES, Paris, Idaho, and R. S. HARTWELL, Garrison, Mont., have purchased for $60,000 the phosphate mining property in Sleight's canyon in Bear Lake county and will rehabilitate the mine and build a pulverizing plant.

Make One Plant Out of Two

MISSOURI-ILLINOIS MATERIAL CO., St. Louis, Mo., has combined its two land sand plants at East St. Louis, Ill., into one large plant with a capacity greater than that of the two plants which it replaces. Electric power has replaced steam power in the new plant.

Sand is pumped from the Mississippi river by a 20-in. pump, and dewatered on the dredge. It is then passed to the new plant by a hoist-operated dump car and a 30-in. belt conveyor on 250-ft. centers. Maximum capacity of the plant is 500 to 600 tons of sand per hour.

Plant built to replace two smaller units Missouri-Illinois Material Co.

P. C. A. Thanksgiving Safety Broadcast

Celebrating Silver Anniversary

THANKSGIVING MASS MEETINGS, as a part of the observance of the Silver Anniversary of Organized Safety Work in the Cement Industry, were held in all or practically all of the cement mills of the United States and Canada on Wednesday afternoon, November 24. Unusual interest was manifest throughout the industry, the outstanding feature being a radio broadcast from New York and Washington over the NBC blue network, with some twenty independent stations co-operating. Over 150,000 workmen and their families and friends listened in. Each mill was equipped with receiving equipment.

The broadcast began at 3:45 p.m., Eastern Standard Time, with the introduction of Col. Henry A. Reninger, safety director of the Lehigh Portland Cement Co., and chairman of the Portland Cement Association's special committee on the Silver Anniversary of Safety. Col. Reninger described the industry's small start in safety work in the fall of 1911, as a result of an experience in which one worker out of every six was injured annually. He traced the remarkable upward trend of the work, eliminating 95 percent of the accidents, until only about one workman out of 140 has been injured in the last 12 months.

John J. Porter, Chairman of the P. C. A. Committee on Accident Prevention and Insurance

Col. Henry A. Reninger, Chairman of Committee on Silver Anniversary of Safety

Col. Reninger then introduced Dr. John W. Finch, director of the United States Bureau of Mines, who spoke from his office in Washington. Dr. Finch, leader of the extensive safety work of the Bureau, spoke in part as follows:

Dr. Finch's Address

"What the cement industry has accomplished in safety during the past twenty-five years stands as its own best monument. Col. Reninger has referred to the members of the first accident prevention committee who were your real safety pioneers and who laid the groundwork on which you have built so effectively. These men took safety seriously and you to whom they entrusted the sacred fire of enthusiasm without which no safety movement can succeed, have carried on no less seriously. The history of what has been accomplished among the workers in cement mills in the comparatively short span of twenty-five years is a matter of public record. But more important still, the lessons learned are indelibly imprinted in the hearts and minds of the thousands of workers who have been the beneficiaries of the cement industry's policy of working safety.

"The industry as represented by the Portland Cement Association, and many individual cement mills have been given the Joseph A. Holmes Safety Award, the highest safety honor connected with any of the industries under the jurisdiction of the Bureau of Mines. In very recent years the Bureau has offered a practical training course in first-aid work as a means of reducing the severity of industrial accidents and giving men an understanding of the serious consequences of personal injuries. The cement industry has been foremost among the heavy goods producers who have availed themselves of this opportunity to train mill men in first-aid principles."

Dr. Finch was followed at the microphone by John J. Porter, president of the North American Cement Corporation, and chairman of the Committee on Accident Prevention and Insurance of the Portland Cement Association. Mr. Porter said in part:

Mr. Porter's Address

"I trust that in expressing appreciation of the progress we have made, no one assumes that we are wholly satisfied over past accomplishments. However important this Silver Anniversary of safety in our industry may be, I feel that it is only a milestone in our march toward greater accomplishments. Let us recognize here and now that in the past twenty-five years we have really

(*Continued on page 75*)

A. J. R. Curtis, assistant to general manager, P. C. A.

Chemists' Corner

Analyzing Industrial Minerals With

Fluorescence From Ultra-Violet Light

By DR. JULIUS GRANT

FILTERED ULTRA-VIOLET LIGHT is now firmly established as a method of investigation and testing in many branches of science and industry. So far as rock products and the related materials covered by this journal are concerned, however, it is felt that the possibilities of the method are not quite so well-known as they deserve to be, and it is the object of this article to indicate the most promising of them.

Briefly, the method depends on the fact that many substances which are invisible or have no distinguishing features in daylight or in ordinary artificial light appear entirely different in filtered ultra-violet light, so that these differences may be used for testing purposes. Ultra-violet light is the name given to that region of the spectrum the rays of which have wave-lengths between 136 and 4,000 A.U. (1 A.U. = 10^{-8}cm.). This region therefore overlaps the X-ray region at one end, the violet rays of the visible spectrum (rainbow colors) at the other; hence its name. Incidentally and as is well known, ultra-violet radiations occur in sunlight, and apparatus exists for utilizing these for the production of fluorescence effects. This method, however, is not particularly effective, and it is far preferable to use one of the efficient ultra-violet lamps now available.

Operation of Ultra-Violet Lamp for Fluorescence Test

A filter is necessary in order to eliminate the effects of the bright invisible light also produced by the lamp, as this masks the fluorescence effects just as visible daylight masks the fluorescence produced by the ultra-violet light from the sun. Wood's glass, which contains nickel oxide, is almost invariably used, and this cuts out very effectively the visible light and only allows the passage of the invisible ultra-violet light.

The lamp is usually mounted in a cabinet, the side or floor of which consists of a slide holding the filter, and the material to be examined is held in such a way that the filtered light falls directly on it; black paper or a black matte tile provides a convenient background. The space is shrouded by means of dark curtains or preferably, the lamp is used in a darkened room. Solid materials may be examined in the whole state, although sometimes it is preferable to grind them or even to extract them with water or dilute acid or alkali and to examine the extract. It is obvious that each alternative method provides an extra string to the bow of the investigator.

So far as minerals are concerned, it has been found that the color of the fluorescence observed depends to a great extent on the source of origin of the mineral, and also that the presence of certain inclusions is also made apparent; these also often serve as an additional means of establishing the origin of the material. One example of the latter type of phenomenon is autunite in porphyry which is rendered visible by means of ultra-violet light; another is the variation in the fluorescence of fluorites produced by the presence of quite small quantities of certain of the rare earths (e.g. europium and ytterbium); these variations usually take the form of red zones or specks which are more apparent after heating. This is an interesting point because few of the rare earth oxides are themselves fluorescent, thorium and zirconium being the two principal exceptions to this rule. Glauberite provides an example of the variation of the fluorescence according to the place of origin, and the non-fluorescent Chilean glauberite is distinguishable in this way from the Californian and other varieties.

Tests for Gypsum And Phosphates

The fluorescence of gypsum, however, varies in intensity rather than in shade. Thus, Sicilian varieties rank among the most intense in this respect, and Bavarian specimens among the least. The writer has also found that the form of calcium sulphate known as "pearl hardening" or "mineral white," used largely in paper-making, also shows variations in shade (red to violet), and although it is not clear what significance these variations have, it is certain that they enable the product of one particular manufacturer to be identified. It has also been claimed that examination in ultra-violet light renders crystal faults in gypsum more obvious, and that this information may be used as a means of determining the age of the mineral.

Phosphatic minerals are also of considerable interest. Most of them fluoresce to some extent but the basic slag from the Thomas process (known as "Thomas meal" to users of fertilizers), has no fluorescence, and is therefore easily distinguishable. A possible source of error here is the greasy substance which is sometimes present in these and other rock products as a result of grinding, because this fluoresces; it can, however, be removed by extraction with alcohol. Autunite and hyalite provide further examples of the variation of fluorescence according to the place of origin.

Willemite is probably the most interesting of all minerals in this respect, and the fluorescence method is used by at least one concern for the routine examination of tailings of the crushed ore. Thus, willemites from Mexico, Belgium and certain parts of Rhodesia have no flourescence, while samples from New Jersey have a bright green color, which sometimes takes the form of spots on a red background if calcite is present. Samples from other parts of Rhodesia appear purple with yellow or blue markings, and some non-fluorescent specimens have been known to develop a flourescence after exposure to ultra-violet light for a short time. Willemite is frequently associated with franklinite, particularly in zinc minerals from New Jersey, but it is distinguishable by its yellow-green fluorescence, the other minerals having a reddish hue. By the

use of a suitable filter it is possible to isolate this fluorescence from that of the surroundings.

It is not unknown for white minerals (e.g. china clay) to be tinted with a blue dye or pigment in order to convey an impression of brightness. The writer has found that this form of sophistication may frequently be detected from the change in fluorescence produced. A good china clay normally appears dull dark violet, but adulteration usually brightens the shade and makes it bluer. The use of the method to distinguish various grades of other white pigments, and especially chalk and zinc oxide, is probably better known. The distinction of galena from anglesite, and of anthracite and graphite rocks from those of bituminous and carboniferous origin, may also be mentioned.

Test Slags For Stability

Some mention has already been made of slags, which may be included among the less valuable rock products. In the examination of these, the use of an extract in 10 per cent hydrochloric acid has proved very useful, especially with basic slags, which are normally nonfluorescent but which may appear brown or yellow if 10 per cent or more of raw phosphates is present. It has also been stated that if a freshly-broken surface of an iron blast-furnace slag appears violet, then it is unlikely that such a slag will disintegrate on storage. Unstable slags are usually characterized by yellow or brown markings. In this connection, it may be mentioned that the weathering of rocks and masonry has been followed in this way, and that the degree of penetration of binding or protective agents may be assessed if a section of the material is examined. Most impregnating substances are fluorescent, but if not, they can frequently be made so by adding a suitable fluorescent "indicator."

In conclusion, it may be mentioned that the investigation of materials such as tar, bitumen, pitch, asphalt, etc., has been the subject of a great deal of work, and that the method is in common use for the routine control of the quality of such products. The glass and ceramic industries may also be counted among those in which the method has found further applications. Museum workers have been able to make considerable use of the method; e.g., to distinguish repairs or restorations on marble and alabaster sculpture work or on ceramic wares of various kinds. An interesting application of the method in the museum is the use of ultra-violet light for the illumination of geological specimens in show cases; some very beautiful results are thereby obtainable.

Average Diameter of Particles Just Passing the 325-Mesh Sieve*

By STEWART S. FRITTS,

Edison Cement Corporation, New Village, N. J.

IN THE DETERMINATION of the specific surface in terms of square centimeters per gram as given by the Wagner turbidimeter (*2*), it is generally assumed that the 325-mesh sieve separates the fraction at 60 microns, although actually it has an aperture of 44 microns. This difference assumes major proportions when calculating the surface area of any finely divided substance such as portland cement. The errors involved amount to as much as 200 sq. cm. per gram in the finer high-early-strength cements, while for the ordinary grades (1400 to 1900 surface area) the errors may be from 50 to 150 sq. cm. per gram.

About a year ago Traxler and Baum (*1*) made a very comprehensive study of the Wagner turbidimeter and set forth several conclusions and limitations as to its use for the determination of the size distribution of particles in finely divided powders. One of their conclusions was that the 325-mesh sieve separated at nearly 45 microns (*1*).

The largest particle passing a No. 325 sieve is usually assumed to have an average diameter of about 60μ because a square opening measuring 43μ on a side has a diagonal of about 60μ. If only two dimensions (length and breadth) of particles just passing this sieve are measured by means of the microscope, the average diameter usually appears to be 60μ. However, by measuring the three axes of a large number of particles just passing a No. 325 sieve it was found that the average diameter is nearer 45μ.

In an effort to clarify some of this work the writer has applied Stokes' law in so far as it pertains to the use of the Wagner turbidimeter.

The material under consideration was that issued by the U. S. Bureau of Standards, No. 46r, for the calibration of the No. 200-mesh sieve. It was carefully washed through the 325-mesh sieve having a correction factor of —0.5 to the residue. The retained material was dried in the oven, and 0.3 gram of the residue was prepared for suspension in accordance with the standard method of procedure as applied to the Wagner turbidimeter. The microammeter was adjusted to give a reading of 23.00 through the tank plus the clear kerosene, with the light filter remaining in place throughout the period of the test. The suspension was then agitated, and placed in the path of the light, and readings were taken as the kerosene in the timing buret passed the marks corresponding to the particle sizes 60, 55, 50, 45, 40 ..... 7.5 microns, and recorded in Table I.

Test 1 consisted of the standard procedure for preparing the suspension, where the sample is placed in a test tube with about 15 cc. of kerosene, stirred for 1 minute, transferred to the tank, and diluted to 335 cc., oleic acid being added to the original mixture to act as a dispersing agent.

Test No. 2 consisted of modifying the procedure by adding the sample to about 100 cc. of kerosene in the tank together with the oleic acid (8 drops) and stirring the mixture for 1 minute as before. The difference was in the elimination of the close contact between the brush and the walls of the test tube, thereby removing all possibilities of a grinding action of the brush on the material under consideration.

Test 3 consisted of merely agitating the mixture of the sample, plus oleic acid, plus 335 cc. of kerosene by rotating the tank through 180° for approximately 1 minute.

TABLE I. PARTICLE SIZE DETERMINATION
(F_s = 23.00)

Micron	Test No. 1	Test No. 2	Test No. 3
60	21.90	22.05	22.40
55	22.40	22.50	22.70
50	22.70	22.90	22.90
45	22.90	23.00	23.00
40	22.90	23.00	23.00
35	22.90	23.00	23.00
30	22.90	23.00	23.00
25	22.90	23.00	23.00
20	22.90	23.00	23.00
15	22.90	23.00	23.00
10	22.90	23.00	23.00
7.5	22.90	23.00	23.00

It may seem that for all tests the particles have either dropped out of suspension or approached a constant value at 45 microns, indicating that the 325-mesh sieve separates at 45 microns and not 60 microns as originally supposed. As for test 1, it may be concluded that the brush has some effect in grinding, although the data may indicate more complete dispersion where the material is in more intimate contact with the agitating medium, which in this case is the brush. This appears to be beyond the purpose of the present paper.

Another point is the introduction of correction factors to the various sieves and in particular the 325-mesh sieve. The standard specifications (A. S. T. M. Designation E11-26) permit a tolerance of 90 per cent in the maximum opening of the No. 325 sieve or a maximum aperture of 84 microns on the side. Consequently, since manufacturing conditions will not permit the fabrication of a perfect sieve having apertures of 43 (or 44) microns, it is necessary to introduce correction factors, either plus or minus, in order to establish some standard or reference value. This is a regular procedure as practiced by the process industries using sieves as a basis of fineness control. The designation of the aperture alone should establish the nominal size of the particles.

The data, as presented from a new viewpoint, give additional experimental proof that the 325-mesh sieve separates at an average particle diameter of 45 microns.

Literature Cited

(1) Traxler, R. N., and Baum, L.A.H., *Proc. Am. Soc. Testing Materials*, 35, Part II, 457 (1935).
(2) Wagner, L. A., *Ibid.*, 33, Part II, 553 (1933).

* Reprinted from *Industrial and Engineering Chemistry*, Analytical Edition, Vol. 9, No. 4.

HINTS AND HELPS FOR SUPERINTENDENTS

Crawler Repaired By Welding On Braces

By WALTER B. LENHART,
Bishop Creek, Calif.

THE CRAWLER IN THE ILLUSTRATION WAS provided with a boom but on a heavy lift the excessive strain caused the frame to break. Obviously, the boom was too long and heavy for the balance of the equipment. Accordingly

Weld steel plates on lower frame of crawler to strengthen boom support

the frame was strengthened by arc welding 1-in. by 6-in. mild steel members that traversed longitudinally along the lower frame and also by welding additional angle braces. Since the strengthening was completed no trouble has been experienced in lifting anything that the assembly could lift.

The lesson is that if other operators contemplate using a crawler for unusual service it might be well to consider strengthing those parts that will receive excessive abuses from the new use.

Trailer for Yard Haulage

By W. C. WILSON,
Supt., Land Improvement Supply Co., Inc.
Port Washington, N. Y.

SEVERAL YEARS AGO we had the problem of hauling steel rails from the railroad yards to our plant. In our neighborhood there was no trailer or truck on which 33-ft. rails could be hauled. A year or two before a fleet of new trucks had been purchased and the old fleet was turned in and junked. Knowing that this old equipment would be junked, one of the best of the chassis was saved for some possible use around the plant. The hauling of the rails mentioned above was the first job for the converted trailer. In order to fit the old truck chassis for the job, a bolster was placed on both the front and rear of the chassis on which we could load the rails. The steering column was cut down so that the steering wheel was below the front bolster and steering could be handled very well from the running board. One truck was used to pull and another for braking down the hills. In this way the rail job was handled without trouble.

Since that time we have purchased a 55-ft. boom for our Diesel operated shovel. This boom was loaded on the old chassis in readiness for moving it to the shovel when we have occasion to change booms, from shovel to crane work, and it has answered our purpose for this job in fine shape. It cost but little to fit this old truck chassis up for the work it is doing, and we have saved a great deal of time and money.

Preventing Segregation In Loading Cars

WHEN LOADING RAILROAD CARS direct from bins the gravel segregates, the large particles tending to come to rest on the edges and outside of the "cone" of material. The Cooley Gravel Co., Chillicothe, Mo., has eliminated this condition very simply by means of a cylindrical funnel of rubber (any material can be used) which has been attached to the end of the car loading chute directly over the longitudinal center line of the cars to be loaded. The cylinder assumes a vertical position at rest but is fastened to the chute by bolts so that it can move in a plane perpendicular to the axis of the car. An ordinary pump jack, used for actuating the vertical plunger in an ordinary farmer's water well, was purchased and installed on the bottom of the bin to be unloaded. The arm of the jack is placed on the horizontal and is fastened to the bottom of the chute funnel. In operation, the arm has a horizontal movement of 12-in. which is transferred to the chute funnel causing the gravel to spread uniformly across the width of the car. The pump jack is driven by a ¼-hp. motor. Since this spreading funnel has been used a man is not needed in the car to spread gravel to prevent segregation.

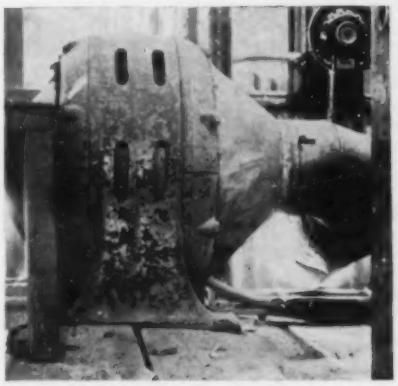
Effective Dust Guard For Motors

IT IS SOMETIMES DOUBTFUL whether the common practice of blowing out motors with compressed air (while motor is in operation) is good practice.

Cylindrical funnel of rubber, attached to the end of the car loading chute, is moved in a plane perpendicular to the axis of the car by a pump jack, causing the gravel to spread uniformly

There can be no question, however, as to the desirability of preventing dust from getting into the motor windings.

The illustration shows how one small crushed stone operator protected the



Sheet iron cone protects pulley side of motor from dust but other end is vented through a 10-in. pipe to the outside

motor driving one of the jaw crushers. The pulley side is protected by a sheet iron cone that has no outlet or vent, but the outboard end of the motor is vented through a 10-in. pipe.

Reclaiming Diesel Engine Oil

CLEANING DIESEL ENGINE lubricating oil for re-use is not a new practice, but the Cooley Gravel Co., is getting a well-bodied very clean product by treating used oil chemically in batch mixers at its Chillicothe, Mo. plant. The plant is powered by a Fairbanks-Morse 200-hp. Diesel engine and a Nordberg 330-hp. Diesel engine, and also has Diesel engine drives on its excavating draglines.

Oil is pumped into the smaller of the stationary engines while the larger engine has 150 gal. of lubricating oil circulating while in operation. Dirty oil from the wiper rings and cylinder walls of all engines is collected in drums, one of which is suspended under the cab of each dragline machine. All dirty oil is taken to the power house for treatment. Cleaned oil is kept available in drums at the power house for re-use.

A regulation supply tank equipped with heating coils, located in a pit under the power house, is used for batch treatment of oil. Batches of 200 gal. of oil are treated on an average of once a week. About 100 gal. of water and 200 gal. of oil are placed in the tank. Heat, applied by a hot water heater, is maintained at 160-180 deg. F. for a day. A chemical, "Oilite", which has the ability to separate impurities from the oil, causing them to sink, is mixed with the hot water and added to the dirty oil to be treated.

A pound of "Oilite" is added for each four gallons of oil to be treated. After a 10-minute period of agitation, the batch is allowed to set for 24 hr., after which the clean oil floating on the water is removed. This is done by admitting water slowly into the bottom of the tank and raising the oil level to the outlet. The cleaned oil is caught in drums, and pumped into the tank serving a De Laval centrifugal oil purifier through which the circulating lubricating oil is passed. This purifier removes the little water which might have accompanied the oil as it drained from the supply tank.

Replacing Broken Bolts

By C. H. WRIGHT,
Snyder, N. Y.

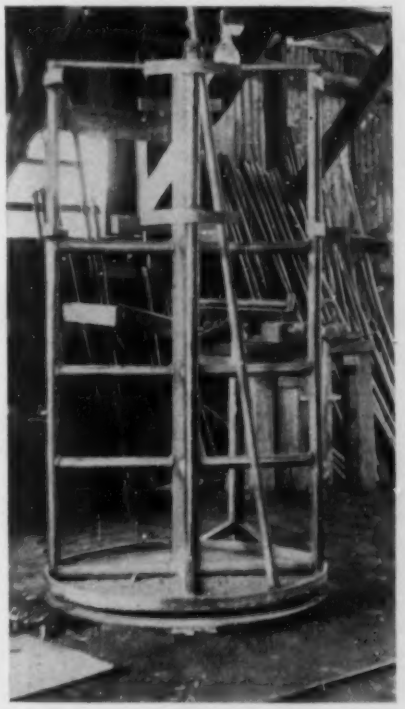
THE SKETCH HEREWITH is intended to show the main engine of a hoisting crane. The chief thing I was interested in here was to save the arm of the crane operator who undertakes to replace a broken bolt in the drum-gear, pinion-shaft cap.

This cap, as well as the crank-shaft bearing cap, were held in place by ¾-in. machine bolts, and in order to replace the inside bolts it was necessary for a man to almost break his arm reaching over the top of the drum-gear pinion, and then underneath it, to get at the place where the bolts were inserted.

So, I removed both caps and drilled the bolt holes out to 29/32 in., tapped the ¾-in. holes out to ⅞ in., put in ⅞-in. stud bolts, using on each bolt a full-sized nut and a half nut for a jam nut, thus making it safe for the operator to remove the caps at any time necessary.

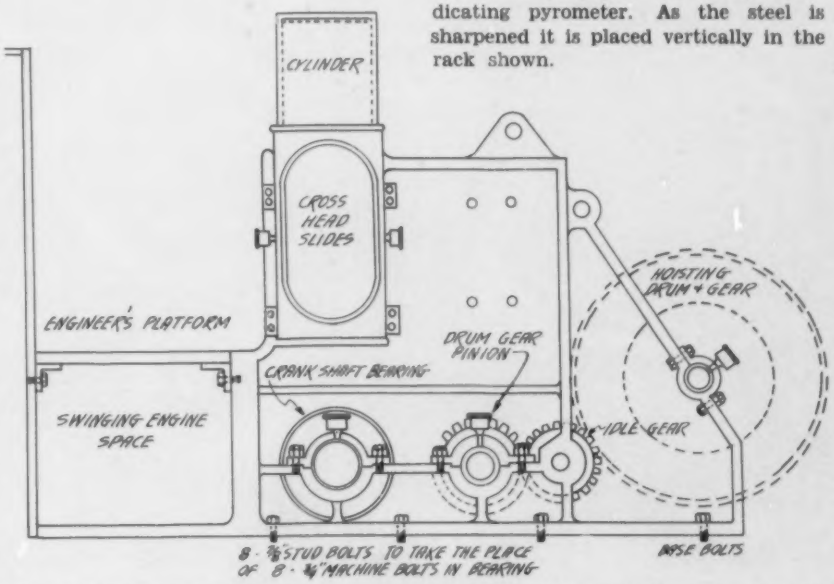
Steel Rack For Tempering Tools

IN THE SHOP in which the illustration was taken the steel is sharpened with Denver equipment and is tempered in a



Rack designed so that it can be turned horizontally on its base

lead bath controlled by a Brown indicating pyrometer. As the steel is sharpened it is placed vertically in the rack shown.



Sketch of main engine of hoisting crane, showing how the replacement of machine bolts with stud bolts made it easier and safer to make repairs

Diesel Drives Unique System of Shafting

CUT COSTS of GYPSUM PLANT

By RALPH S. TORGERSON

EXPERIENCE of the Pyramid Gypsum Plaster Co., at Levan, Utah, with a Diesel engine driving all plant equipment direct through a system of shafts and belting should be of interest to others facing a similar problem.

Material for the mill is supplied from an open quarry, the gypsum rock being blasted down with black powder and dynamite. Ore cars hold two tons each and run by gravity to the mill, which is located at an altitude of 5050 ft. From mine to sack, the waste loss is only 15 percent.

Power for the operation of the plaster mill is supplied by a 6-cylinder, 125-hp. Caterpillar Diesel, D-13000 model, which is connected by a flat belt drive to a 60-in. pulley on the jack-shaft. Crushing, grinding, calcining and sacking equipment is all shaft-driven by the Diesel engine. The driving mechanism is an interesting sequence of shafts, pulleys, and belting, all contributing to the efficiency of the mill.

Equipment All Operated from Shafting

The Diesel engine, running at 850 r.p.m., drives from a 15.5-in. pulley to a 60-in. pulley on a jack-shaft which also has a 48-in. pulley. From the 48-in. pulley, a belt running to a 96-in. pulley drives the kettle shaft at about 110 r.p.m. A 96-in. pulley on the kettle line shaft drives a 48-in. pulley which turns the buhr mill line shaft of 220-r.p.m.

Part of the Pyramid Gypsum Plaster Co. plant. Track to quarry shown above, to the right

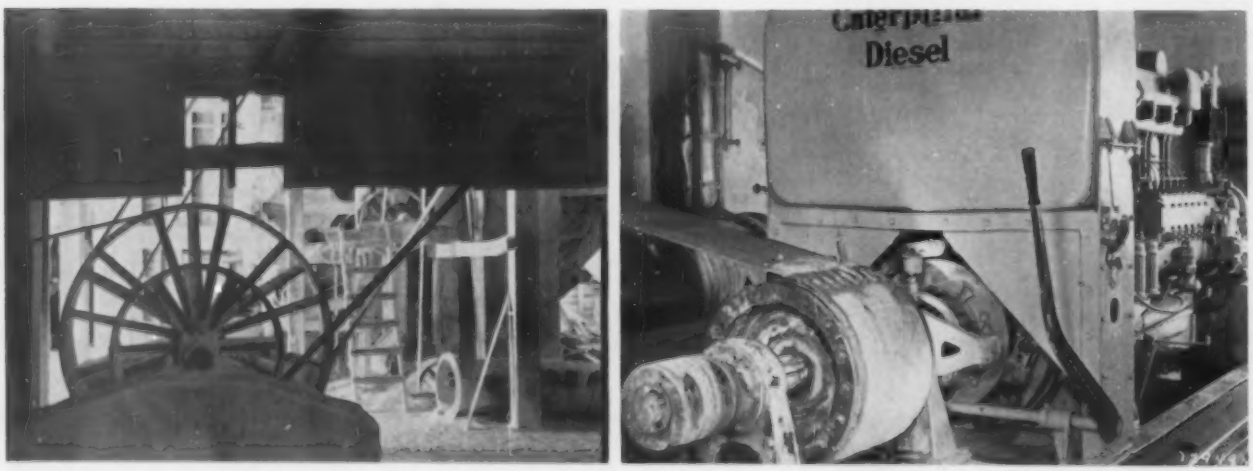
Two 36-in. buhr mills for pulverizing are driven from 60-in. pulleys on the buhr mill line shaft to 28-in. pulleys on the buhr mills, which are turned at approximately 500-r.p.m.

From the buhr mill line shaft, the drive is from a 36-in. pulley to another 36-in. pulley on a small shaft with two pulleys. One of the two pulleys drives the primary jaw crusher and the other drives the secondary crusher. Both crushers operate at 225-r.p.m. Screw conveyors, filling and emptying the kettles, are driven by belt from the kettle line shaft. The bag packer is driven by pulleys from the jack-shaft.

As sufficient material to operate the mill may be crushed in one-half the full labor shift, the crusher is shut down for the balance of the day and the bag packer and mixer are operated during the second half of the working period. This arrangement has contributed materially in making possible a production of 600 sacks per shift.

Basis of Determining Diesel Operating Costs

The estimated Diesel engine power cost of 45.2 cents per hour is based on approximately 700 hours of operation. Diesel fuel costs 11¼ cents per gallon; lubricating oil, 50 cents per gallon. Fuel consumption averaged 3½ gal. per hour, and the lubricating oil was changed every 60 hours. The fuel cost of the en-



Left: Jack-shaft which is driven from Diesel engine. Right: Diesel engine is connected by a flat belt drive to a 60-in. pulley on the jack-shaft. All crushing, grinding, calcining and sacking equipment is shaft-driven

gine for one day is about the same amount as the former cost for a man to fire the boiler.

A heat exchanger made from an old copper tube water heater provided the cooling system for the Diesel engine. Spring water, piped from the mountain, was used in the cooling system.

Before the installation of the Diesel engine, the mill had been in operation

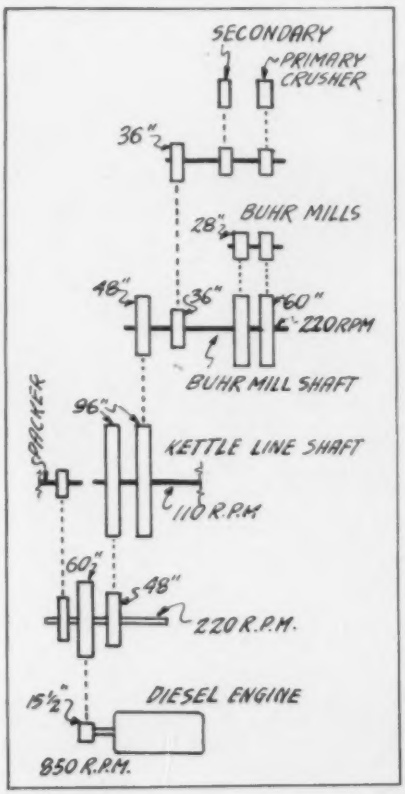


Diagram showing how Diesel engine drives gypsum plant machinery

for nearly 30 years. For most of this period water-power was used. About three years ago, however, a 125-hp. steam engine and 150-hp. boiler were purchased. This plant was only operated for about two years, and was then junked in favor of the new Diesel equipment.

Here is another example of the economical use of Diesel engine units where electric power is not easily available.

LINCOLN SAND AND GRAVEL CO., Lincoln, Ill., plans for reorganization have been approved by court order upon failure of creditors to press their claims. The decree was followed with an order dismissing the company from proceedings under section 77-b of the federal bankruptcy act. Attorneys for the company told the court that $60,000 had been borrowed from the Reconstruction Finance Corporation by the directors to complete reorganization.

Improve Screen Equipment

In New Sand and Gravel Plant

HAVING EXHAUSTED ITS DEPOSIT at Milwaukee, Wis., the Edward Lutz Sand and Gravel Co., removed the plant to a glaciated gravel deposit on property of the Northwestern railroad near Germantown, Sussex County. The plant has been producing about 100 tons of washed sand and gravel per hour at the new location this season.

Operation of the plant is essentially the same as before except for the addition of more screening surface for production of additional gravel sizes. Excavation work is done with a Koehring ¾-cu. yd. gasoline shovel, delivering to a 5-cu. yd. field hopper. From the field hopper, an oscillating feeder regulates the flow of sand and gravel to a 24-in. belt conveyor, 60-ft. centers, which discharges to an 8-in. grizzley and then to a 4- x 10-ft. Telsmith revolving screen.

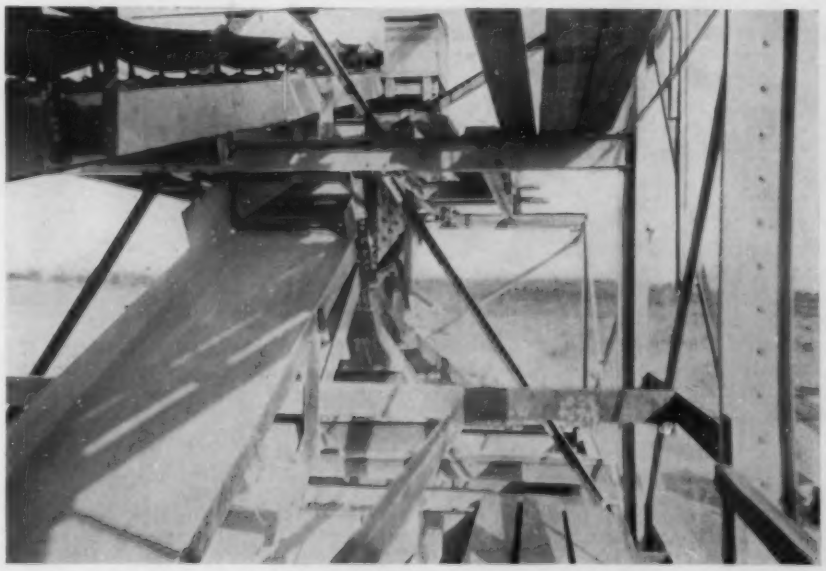
Plus 2½-in. gravel is crushed by an 8-in. McCully crusher and is returned to the scalping screen by bucket elevator, on 30-ft. centers. The scalping screen throughs are carried to the screening and washing plant by a 24-in. belt conveyor, 190-ft. centers. After passing through a revolving combination Telsmith scrubber and revolving screen, the sand (¼-in. minus) is diverted to a Lippman sand drag, and a belt conveyor, 27-ft. centers, carries the ¼ to 2½-in. gravel to a three-deck Telsmith mechanical vibrating screen. Sized material is placed in six bins of 100 tons capacity each, and shipments from the new plant are made on the Northwestern railroad.

Typical gradations are 1½-to 2½-in. gravel, ¾- to 1½-in., ¼- to ¾-in. and

Edward Lutz, president, on the right; crane operator to the left

concrete sand. Wash water is applied as the conveyor discharges into the scrubber.

OHIO STATE UTILITIES COMMISSION concurred with the interstate commerce commission to increase freight rates, effective November 10, on basic commodities including lime and cement.



Triple-deck mechanical vibrating screen at the new plant of Edward Lutz Sand and Gravel Co., near Germantown, Wis.

NATIONAL ASSOCIATION *Activities*

Crushed Stone

NATIONAL CRUSHED STONE ASSOCIATION executive committee met in Washington, D. C., November 9. The discussion was largely about arrangements for the January annual convention. The following members were present: H. E. Rodes, chairman, Otho M. Graves, Russell Rarey, Stirling Tomkins, T. I. Weston, A. L. Worthen.

•

The following new active members of the association are reported: Blue Rock, Inc., Washington Court House, Ohio; Erie Stone Co., Indianapolis, Ind., and four new associate members: Blaw-Knox Co., Blawnox, Penn.; Koppel Division, Pressed Steel Car Co., Pittsburgh, Penn.; Caterpillar Tractor Co., Peoria, Ill.; Ross Screen and Feeder Co., New York City.

•

Up to November 23 applications for exhibit space at the January convention, Netherland Plaza hotel, Cincinnati, Ohio, had been received from 35 members of the manufacturers' division (associate members of the N. C. S. A.).

•

Part of the program for the convention has been definitely scheduled as follows:

"What Is the Future of Private Enterprise?"—Donald D. Conn, executive vice-president, Transportation Association of America, Chicago, Ill.

"Diesel Power in the Crushed Stone Industry"—Lacey H. Morrison, editor, "Diesel Power" and "Diesel Transportation," New York City.

"The Effect of Economic and Social Changes on Cost"—A. D. Berning, resident partner, Ernst and Ernst, New York City.

"Ground Vibration from Quarry Blasting"—J. R. Thoenen, consulting mining engineer, U. S. Bureau of Mines, College Park, Md.

The concluding session on Wednesday afternoon will be largely devoted to a discussion of labor relations in the crushed stone industry and to a report on federal wage and hour legislation to be submitted by a special committee, the chairman of which is Otho M. Graves. The remainder of the committee has not yet been appointed.

•

Several diverse lines of activity have engaged the attention of A. T. Goldbeck, engineering director, National Crushed Stone Association, during the past month. In Washington a conference was held in connection with specifications for size of aggregate to allow for the differences in results obtained with two different sieves, both of them conforming with the present sieve standards.

In New York State a number of stone producers this past year were required to furnish, for bituminous concrete mixtures, a large percentage of their output graded between the ⅛-in. and ¼-in. screens. This resulted in high production expense and considerable waste. A conference, in an attempt to relieve this situation, was had with the proper highway officials.

A paper was presented in Boston before the New York and New England Engineers' annual meeting on "The Relation of the Los Angeles Rattler Test to Service Value of Aggregates." This paper was based on tests of the National Crushed Stone Association.

At the same conference coöperation was given to the Testing Engineers in a further attempt to bring about the standardization of sizes in the New England States. Considerable progress was made at this meeting.

An interesting meeting of the Massachusetts Stone Producers Association was attended and also conferences were held with the Massachusetts State Department of Public Works in connection with specification matters.

1938 Conventions

AMERICAN Road Congress, Machinery Show and convention of American Road Builders' Association, Cleveland, Ohio, January 17-22.

• • •

NATIONAL Crushed Stone Association, annual convention and machinery exhibit at Cincinnati, Ohio, January 24-26, incl., Netherland Plaza Hotel.

• • •

NATIONAL Sand and Gravel Association, annual convention and machinery exhibit at Cincinnati, Ohio, February 1-3, incl., Netherland Plaza Hotel.

• • •

NATIONAL Ready Mixed Concrete Association, annual convention and machinery exhibit, February 1-3, incl., Netherland Plaza Hotel.

• • •

NATIONAL Concrete Masonry Association, National Cinder Concrete Products Association annual conventions, February 8-11, incl., Hotel Sherman, Chicago, Ill., in conjunction with the American Concrete Contractors' Association. The Cast Stone Institute, Medinah Club, Chicago, February 7-8. The Concrete Industries Exposition at the Hotel Sherman, February 8-11.

• • •

AMERICAN Concrete Pipe Association annual convention at the Plaza Hotel, San Antonio, Texas, February 15-16.

Sand and Gravel

The National Sand and Gravel Association has made an arrangement with the College of Engineering of the University of Maryland for the conduct of research at the University, according to an announcement by Stanton Walker, director of engineering. Testing equipment which is now in the laboratory of the association in the Munsey Building, Washington, D. C., will be removed to the university at College Park, Md., only a few miles from Washington. The research work started by the association when its laboratory was established in 1928 will be continued at the university. The new arrangement provides for the National Sand and Gravel Association Research Foundation, which will be operated by the association with its activities subject to the approval of a joint advisory committee on which the university and the association will have equal representation.

The University of Maryland, a state institution, has a high standing. It was established in 1807 and offers comprehensive courses in engineering, agriculture, chemistry, medicine, business administration, and other standard subjects. Its president, Dr. H. C. Byrd, is an aggressive administrator and educator. Its Engineering College is accredited by the Engineers Council for Professional Development. The dean of engineering, S. S. Steinberg, has a broad background of experience and a sympathetic understanding of problems of the nature of those which the Founda-

tion will investigate. Dean Steinberg will serve as one of the University's representatives on the joint advisory committee. Stanton Walker, Director of Engineering of the Association, will be a member of the joint advisory committee and the work of the Foundation will be directed by him.

Space in the engineering building of the university has been made available for the work of the Foundation and additional space will be provided from time to time as conditions require. Under the arrangement, the university will have the privilege of using much of the association's equipment and the association will have the privilege of using much of the university's equipment. The association's equipment is to be moved to the university during the current year and the operation of the foundation will be started January 1, 1938.

The research committee of the association, of which Alex. W. Dann is chairman, already has outlined a number of problems to be investigated and a detailed report in that regard will be presented at the forthcoming annual convention of the association. Illustrative of the subjects being given prominent consideration by the research committee are:

Adhesion of bitumens to aggregates of different mineral composition and surface texture.

Stability and durability of bituminous mixtures as affected by shape of aggregate particle.

Fatigue of concrete subjected to repeated impact and static loads as affected by characteristics of aggregate.

Identification of aggregate particles considered harmful to the finished product and methods for evaluating their effects.

National survey of aggregate characteristics to provide bases for specifications in different localities.

The establishment of the Foundation makes available to the association more equipment and better facilities for its investigational work than it has had heretofore. It also provides an opportunity for the university to increase the scope of its engineering research. It is earnestly believed that the arrangement will work to the mutual benefit of the university and the association. A further advantage is that the association will be in a position to keep in closer touch with the industrial minerals researches of the U. S. Bureau of Mines, which are centered at the Eastern Experiment Station of the Bureau located on the campus at College Park.

●

Regarding the proposed 15 percent horizontal increase in freight rates, V. P. Ahearn, executive secretary, has informed his members:

"It is the purpose of the National Sand and Gravel Association, in co-operation with other organizations similarly affected, to intervene in Ex Parte No. 123 of the Interstate Commerce Commission and to state the reasons which move our industry to insist that a superimposed increase of 15 percent in sand and gravel rates will be detrimental to the interests of the railroads and ourselves.

There are two points of legitimate objection to a 15 percent increase in sand and gravel rates. In Ex Parte No. 103 of the Interstate Commerce Commission, four witnesses appearing for the National Sand and Gravel Association testified in opposition to the percentage method of increasing rates. They quoted with approval an excerpt from a report of a committee of the association submitted at a meeting of producers held in St. Louis on July 31, 1931, reading as follows:

"This committee is of the opinion, in the event of an authorized increase in sand and gravel rates, that such increase should be expressed in flat cents per ton rather than by percentage increase, to the end that present competitive relationships, in many cases approved by the Interstate Commerce Commission and by state commissions, may be preserved and maintained.

"It is, of course, obvious that a percentage increase in freight rates would change and disturb existing competitive relationships. If there are any competitive relationships at the present time which are wrong and should be corrected, it was the feeling of member companies at that time that a revenue case (such as Ex Parte No. 123) is not the place to institute a new basis. On the other hand, if existing competitive relationships are right, a revenue case should not be permitted to be the means of disrupting them. The final decision of the Commission in Ex Parte No. 103 supported this position and the increases therein authorized on all commodities were expressed in flat cents per ton in their application to sand and gravel. It seems proper under these circumstances that the association should say in Ex Parte No. 123 that if the Commission should conclude that all commodities, irrespective of their individual showing, must bear some measure of the increased revenue burden of the railroads, that any increase thus arbitrarily applied to sand and gravel should be stated in flat cents per ton rather than as a percentage increase."

Asphalt Conference Meets in Memphis

ELEVENTH NATIONAL ASPHALT CONFERENCE is to be held at the Peabody Hotel, Memphis, Tenn., December 6 to 10, under the joint sponsorship of the Asphalt Institute, the Association of Asphalt Paving Technologists, the City of Memphis and the State of Tennessee.

Concrete Products Conventions

A HIGHLY EDUCATIONAL PROGRAM is rapidly being prepared for Chicago's coming concrete products convention week, February 8-11 incl., when the National Concrete Masonry Association, National Cinder Concrete Products Association, Cast Stone Institute and the American Concrete Contractors Association hold their annual meetings. The Cast Stone Institute will hold its meetings at the Medinah Club, February 7 and 8. All other sessions and the Concrete Industries Exposition will again be held at the Sherman Hotel.

Record-breaking attendance figures of last year undoubtedly will be surpassed, judging from advance reservations, and the Concrete Industries Exposition has already allotted more space for machinery exhibits than the total a year ago.

Exhibits at the exposition will show the latest in machinery, new processes and accessory equipment, all under one roof, and products manufacturers will be given the opportunity to see equipment in actual operation.

Subjects of greatest importance and interest to all in attendance are being outlined. Nationally-known speakers will be selected to tell the manufacturers of concrete products and ready-mixed concrete as well as the small contractor how to make a better product and how to merchandise it. The January issue of ROCK PRODUCTS will contain an outline of the principal subjects to be discussed.

Safety Groups Select Chicago for 1938

NATIONAL SAFETY COUNCIL, Chicago, Ill., will hold its 1938 National Safety Congress at the Stevens Hotel, Chicago, October 10-14. Every conceivable phase of safety is to be treated by more than 400 speakers in 200 sessions.

Chemical Industries Exposition

SIXTEENTH EXPOSITION ON CHEMICAL INDUSTRIES, meeting at Grand Central Palace, New York, N. Y., December 6 to 11, will display products and equipment for the benefit of business executives, chemists and chemical engineers.

LEHIGH PORTLAND CEMENT CO., Allentown, Penn., through its western district manager, W. G. Perrow, has announced a reduction ranging from 17c a bbl. at Spokane, Wash., to 40c at the Metaline Falls, Wash., mill. The reduction applies to high early strength as well as standard cement. This plant has been operating at practically 100 percent capacity.

LIME PRODUCERS' FORUM

Conducted by Victor J. Azbe, Contributing Editor, St. Louis, Mo.

Design Kilns For Efficient Draft

ALL KILNS, even natural draft kilns, should have a top arranged so that it can be closed tightly. When slow firing, the kiln will keep hot for a very long time if the top is closed. Such tops should be equipped with vents through which the gases will escape, and the vents should be separate from the charging doors.

All vents should be designed to permit regulation of the opening; in other words, they should be equipped with a damper. In natural draft kiln operation, producing the maximum quantity of lime, the damper will be wide open. If less lime is wanted and natural gas is the fuel, the top damper should be closed so there will be considerable pressure; that is, 0.2 or 0.3 in. below the top. When more lime is wanted than the natural draft capacity, it will be necessary to resort to induced draft. The damper will then be regulated to obtain a draft that will vary about as follows:

Half Normal Natural Draft Capacity	0.3 in.
Normal natural draft capacity	0 in.
50 percent more than Normal Natural Draft Capacity	0.6 in.
100 percent more than Normal Natural Draft Capacity	1.5 in.
150 percent more than Normal Natural Draft Capacity	2.0 in.
200 percent more than Normal Natural Draft Capacity	4.0 in.

As the kiln itself makes about 0.5 in. of draft by virtue of the stack effect of its hot gas column, then the actual draft, although not the measured draft, in each of the above cases is increased by that amount. It will be seen that the total draft necessary for double the capacity is four times the draft for normal capacity. In the higher brackets it goes up very rapidly.

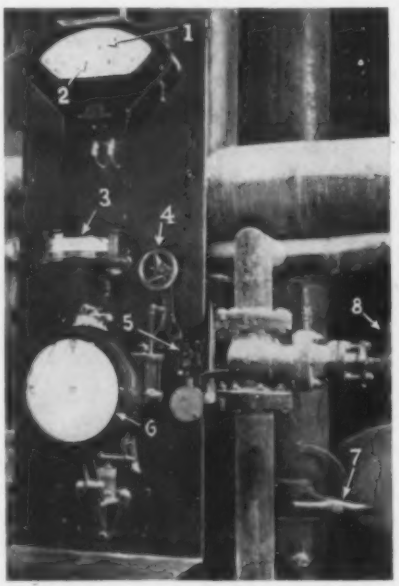
The draft given applies only to normal sized stone. If stone is larger it will be less, and if smaller much more, but the relationship will remain the same. Quite often the draft drop through the kiln, even for normal stone, is much greater but this is caused by a large amount of excess air passing through the kiln. A trained superintendent can tell much about the misbehavior of kilns by the behavior of the draft gauge. For that reason, draft gauges should be large, easily read and prominently located.

At the Glen Park plant of the Glencoe Lime & Cement Co., St. Louis, Mo., they have a particularly good system of control, which permits regulation of lime output at will, just like the output of steam from the boiler is regulated. An orifice type gas meter, having a recording chart and draft gauges, is used. The amount of gas and corresponding draft has been worked out, and if the fireman receives an order for certain tonnage, in a few moments he has the kiln set for that condition and from then on he draws lime at that rate.

* Part of a paper delivered at the 19th annual convention of the National Lime Association, Chicago, Ill., May 12, 1937.

Controls of Modern High Capacity Lime Kiln

ORDINARY KILNS have nothing with which to check operations and practically no controls. Since some lime kilns burn as much as $2000 worth of fuel during a month's operation, it seems that a reasonable expenditure for instrumentation and convenient control would bear good returns. Electrical apparatus is usually heavily instrumented, and the possibility of waste with this equipment is far less than in the case of lime kilns.



Lime kiln control instruments on panel. 1. Kiln top draft gauge. 2. Firing level draft gauge. 3. Exhaust gas temperature. 4. Exhaust fan damper control. 5. Fan start and stop switch. 6. Gas flow meter. 7. Damper regulating air to cooler. 8. Gas regulating valve

In the illustration is shown an instrument and control board on a lime kiln which produces, at the operator's will, from one-half to one ton of lime per square foot of shaft area. Without moving from his position, the operator can regulate the draft, gas, air, start and stop the fan, and when any changes occur he can correct them immediately. On the instrument board are shown the following apparatus: Kiln top draft gauge, firing level draft gauge, exhaust gas temperature recorder, exhaust fan damper control, fan start and stop switch, gas flow meter, damper regulating air to cooler, and gas regulating valve.

It is very doubtful whether this particular kiln, without the instruments shown, would have within 15 percent of the present capacity and fuel waste would also be greater. It would not be an exaggeration to state that on a large kiln during a month's time, the total loss due to unnecessary fuel waste, increased labor cost, reduced capacity and lining waste would run from $500 to $1000 or even more. Therefore, first cost of properly selected and installed and intelligently used instruments would be by comparison a very small investment.

World's Record Kiln

IT'S A CHALLENGE! If proof is offered of a kiln putting out more or better lime than the No. 9 kiln of the Peerless Lime Company at St. Genevieve, the FORUM EDITOR agrees to push a bean with his nose any distance—across the continent for that matter.

A new firing system was recently installed in the No. 9 kiln of Peerless White Lime Co. at St. Genevieve, Mo., and as a result it produced on the average over 75 tons of lime daily for six days straight of normal operation. The lime was beautifully white, the core was consistently less than 2 percent. The CaO content was 96 percent, $CaCO_3$ was between 1.2 and 1.5, and the lime was not overburned; quite the contrary, in fact.

If the gas producer, connected to many kilns, had not been overloaded, a 75-ton production would have been assured. To the writer's knowledge, there are no other gas-fired kilns producing this amount of high calcium lime.

The kiln operates with the patented center burner on one level and with an additional set of external burners on a higher level, providing a two-level firing zone. Kiln draws are made every four hours, and on every draw nearly 12 tons of lime are removed. The kiln constitutes a fair size lime plant in itself. In spite of the large amount drawn, the kiln handles readily.

One would think that the refractory problem in a kiln of this high capacity would be serious, but this was not the case. The walls, in fact, are cooler than before when all the gas was introduced through outside burners. The outside gas is introduced at a high level where lime has considerable core. This prevents too high temperatures from developing in the upper level, and below the high temperature is away from the walls.

Performance of this kiln proves beyond any doubt that with Dolomite, 100-ton daily capacity, gas-fired vertical kilns are entirely practical.

It may be that through the years to come individual capacities of vertical gas fired kilns may somehow be further raised, but at present it does seem that a 100-ton upper limit for Dolomite and 75 tons for high calcium constitute quite satisfactory limits.

Rotary Kiln Performance

SIR: On page 68 of the October issue of ROCK PRODUCTS appears an article entitled "We Want to Know About Operating Results" by Victor J Azbe. Mr. Azbe refers to the article in the August issue describing my new lime plant and criticizes the fact that complete operating results on my 290-ft. Unax kiln were lacking.

Mr. Azbe must realize that there is certain information which must be considered the property of the owner of a plant. In my opinion the article describing my new plant gives entirely sufficient data to show that the plant is successful, both with respect to quality of product and efficiency of machinery.

I am somewhat surprised to note the skepticism expressed by Mr. Azbe as to the satisfactory performance of this kiln and concerning fuel consumption and output.

I do not mind confirming that the very satisfactory guarantees as originally made to us by F. L. Smidth & Co., have been fulfilled; and that while the kiln was designed for a normal output of 125 tons of burned lime per day, we have found it is possible to increase this production as much as approximately 35 percent.

If Mr. Azbe or any of the readers of ROCK PRODUCTS should desire additional information as to the performance of this machinery, I shall be glad to have them communicate direct with me.

H. E. MILLARD.

Phosphate Rock Shipments Still Increasing

MIDYEAR REPORTS forecast a 20 percent increase in shipments of phosphate rock during the current year as compared with 1936 when they aggregated 3,351,857 long tons valued at $11,406,132. For the first six months of 1937 the quantity of phosphate rock sold or used in the United States, as compiled from reports to the United States Bureau of Mines, was 1,930,582 tons valued at $5,922,332. Production of superphosphate, by far the leading use for phosphate rock, advanced 48.1 percent. Exports reported by producers for the 6-month period of 1937 aggregated 413,030 long tons valued at $1,661,742 and represented only 21 percent of the total tonnage shipped, compared with 35 percent of the total shipments during the whole of 1936. In 1937, 23 percent of the tonnage was for consumption by the producer or affiliated companies and 56 percent was shipped to other domestic consumers. Florida continues to be by far the largest producing state but its recovery has been slightly slower than the increase in Tennessee and the western States.

Much Activity in Mining Pyrophyllite

MOORE, RANDOLPH and Orange counties, N. C., with practically a world-wide monopoly on the production of pyrophyllite, are the center of much recent activity. New uses developed for the mineral are said to be responsible for the development work now under way. The Standard Mineral Co., Hemp., a subsidiary of R. T. Vanderbilt Co., New York, is constructing a new grinding plant and making other improvements at a total cost of about $250,000. The Pyrophyllite Talc Products, Inc., Glendon, is installing a new power plant and reconditioning the grinding mill to have a daily capacity of 60 tons. Clinchfield Sand and Feldspar Corp., Baltimore, Md., is uncovering a new vein near Glendon and has already installed machinery for drying and screening volcanic ash mined from recently-acquired properties.

Large Asbestos Deposit Discovered in Canada

A LARGE CREW of men under the direction of J. J. Papineau, the discoverer, is trenching and stripping to determine the available tonnage in a newly-found asbestos deposit in the Rice lake area of Manitoba. The deposit appears to be 1500 ft. wide and more than a mile in length. Preliminary samples are practically all No. 1 and No. 2 asbestos.

Complete New Tailing Plant

BAXTER CHAT CO., Baxter Springs, Kan., is completing a new tailing plant near Treece, Kan. Most of the building materials used were taken from the dismantled plant at Baxter Springs. The new mill will have a capacity of 60 tons of tailings per hour.

Merchandising Rock Wool

THE BARRETT CO., New York, N. Y., has announced its line of rock wool insulation in two recently published folders. The line includes loose-fill, granulated and batted rock wool for every housing insulation purpose.

Numerous Accidents Occur in Small Quarries

Many accidents have been occurring in the smaller quarry operations, several of which can probably be attributed to an absence of safety devices and adequate supervision. A few cases are mentioned here, because the underlying causes of many of the accidents exist in permanent plants and are too often recognized only after death or serious injury has occurred. A few such recent incidents are mentioned as follows:

An employe of a gravel contracting firm near Mankato, Minn., was killed when a gravel bank caved and completely buried him. The employe had lowered himself into a deep pit to prepare a place for a charge of dynamite when the bank caved.

An employe suffered serious injuries at a gravel pit in Austin, Minn., when he was caught between the box and frame of a truck, and when the truck box was lowered it struck him full on the chest and abdomen.

A quarry employe was electrocuted while at work in a rock quarry near Union, Mo.

A driller at the Cedar county quarry in Missouri was injured seriously when his drill penetrated into a hole which had been loaded with a charge of dynamite. Particles of stone and dust were blown into his face, causing shock and burns.

A Princeton, Mo., man had his foot crushed while working at a rock crusher near the city.

These are but a few cases where a little diligence and care could have saved much human suffering as well as life itself.

NELSON CONCRETE CULVERT CO., Champaign, Ill., has built a plant at 26th St. and McCasland Ave., East St. Louis, Ill. Concrete pipe culverts from 6- to 108-in. diameter will be manufactured.

Recent Quotations on Rock Products Securities

Stock	Date	Bid	Asked	Dividends	
Aetna P. C., cap.[34]	11-20-37	21	..		
Allentown P. C. (Penn.), com.[34]	8-24-37	6	..		
Allentown P. C. (Penn.), 6% cum. pfd.[34]	11-20-37	9	..		
Alpha P. C., com.	11-22-37	13	..	.25	Dec. 21
American Aggregates, 1st mtg., 3/6's 1943, new bonds[48]	11-12-37	75	..		
American Aggregates, com.[48]	11-12-37	24	34		
American Aggregates, 6's 1943 old[48]	11-12-37	75	..		
American Aggregates, pfd.[48]	11-12-37	25	35		
Arundel Corp., com.	11-22-37	16½	..	.25	Oct. 1
Ash Grove L. & P. C., com.[34]	11-20-37	13	..		
Ash Grove L. & P. C., pfd.[34]	11-20-37	95	..		
Bessemer L. & C., com.[48]	11-12-37	3	4½		
Bessemer L. & C., pfd.[48]	11-12-37	50	54		
Bessemer L. & C., 6½'s, 1947[48]	11-12-37	93	97		
Bessemer L. & C., 1st 6's, 1955[34]	11-20-37	..	96		
Boston S. & G., com.[37]	11-12-37	1	2		
Boston S. & G., 7% pfd.[37]	11-12-37	6	10		
Boston S. & G., 7's 1939[37]	11-12-37	80	..		
Calaveras Cement, com.[49]	11-16-37	3⅞	4⅜		
Calaveras Cement, 7% pfd.[49]	11-16-37	..	90	2.00	Sept. 30
California Art Tile, A[9]	10-20-37	8	10		
California Art Tile, B[9]	10-20-37	1	1½		
Canada Cement, com.[42]	11-18-37	8⅞	9		
Canada Cement, pfd.[42]	11-18-37	95½	97	1.25	Dec. 20
Canada Cement, 4¼'s, 1951[42]	11-18-37	102	103		
Canada Crushed Stone, 6½'s, 1944[42]	11-18-37	99¾	100½		
Carolina P. C., 8% cum. pfd.[34]	11-20-37	50	..		
Consol. Cement A[34]	11-20-37	3	4¼		
Consol. Cement, 1st 6's 1950[34]	11-15-37	60	63		
Consol. Okla. S. & G. pfd. 6½'s 1948[42]	11-18-37	20	30		
Consol. S. & G. pfd.	..	..	..		
Consol. Rock Products, units[50]	11-15-37	½	1¼		
Consumers R. & G. 1st Mtg. 6's 1948[34]	11-20-37	24	..		
Coosa P. C., 1st 6's[34]	9-27-37	58	..		
Coplay Cement Mfg., pfd.[50]	11-15-37	15	..		
Coplay Cement Mfg., 6's 1941[50]	11-15-37	95	..		
Cumberland P. C., units[34]	11-20-37	54	..		
Cumberland P. C., 7's, 1937[34]	.....				
Dewey P. C., com.[34]	11-20-37	23	26		
Diamond P. C.	11-22-37	32	36		
Dolese & Shepard	9-30-37	38	42		
Federal P. C., 5's 1947[34]	11-20-37	60	65		
Federal P. C., 6½'s 1941[49]	Mkt.				
Fla. P. C., units[50]	11-15-37	23½	25½		
Fla. P. C., 6½'s 1937[46]	11-10-37	98	..		
Giant P. C., com.[50]	11-15-37	1½	3		
Giant P. C., pfd.[50]	11-15-37	8	10		
Glens Falls P. C., com.[34]	11-20-37	12	..		
Glens Falls P. C., pfd.[34]	11-20-37	80	..		
Great Lakes P. C., B[34]	11-20-37	½	..		
Gyp., Lime & Alabastine	10-23-37	6	9		
Gyp., Lime & Alabastine, 5½'s, 1948[42]	11-18-37	98	100		
Hawkeye P. C., cap.[50]	11-15-37	29	..		
Hercules Cement, com.[34]	11-20-37	43	53		
Ideal Cement, com.[50]	11-15-37	22½	23½	.50	Sept. 30
Kelley Island L. & T.	11-22-37	17½	..	.40	Dec. 15
Ky. Rock Asphalt, 6½'s, 1936[46]	11-10-37	42	45		
Ky. Stone Co., v.t.c.[46]	11-10-37	6	10		
Ky. Stone Co., 5%, 1956[46]	11-10-37	46	..		
Keystone P. C., pfd.[51]	11-20-37	30	..		
Lawrence P. C., com.	11-25-37	16	18		
Lawrence P. C., 5½'s, 1942[50]	11-15-37	100	..		
Lehigh P. C., com.	11-22-37	10	..	Q .37½	Nov. 1
Lehigh P. C., 4% pfd.	11-22-37	100	..	Q 1.00	Jan. 3
Lone Star Cement, com.	11-22-37	35½	..	.75	Dec. 23
Longhorn P. C. Co.	11-20-37	6¾	7½		
Louisville Cement	11-24-37	35	40	.75	Dec. 23
Lyman-Richey, 1st 5's ext. to 1945[34]	11-20-37	48	..		
Marbellte Corp., com.[49]	11-16-37	½	1		
Marbellte Corp., pfd.[49]	11-16-37	3½	4½		
Marblehead Lime, 7's, 1944[34]	11-10-37	90	95		
Marquette Cement, com.	11-22-37	36	37		
Marquette Cement, pfd.[50]	11-15-37	95	..		
Material Service Corp.[50]	11-15-37	12	..		
McCrady-Rodgers, Class "A" com.[50]	11-15-37	4	..		
McCrady-Rodgers, 7% pfd.[50]	11-15-37	23	..		
Medusa P. C., com.	11-22-37	19	21½	Q 1.50	Oct. 1
Medusa P. C., 6% cum. pfd.[34]	11-20-37	99	102		
Michigan L. & C., com.[34]	.....				
Michigan Silica Co., com.	.....			Q .07½	Sept. 30
Minnesota Mining & Mfg. Co.	11-25-37	25	..	.60	Sept. 30
Missouri P. C.	11-22-37	11	12½		
Monarch Cement, cap.[51]	11-20-37	99	105		
Monolith P. C., com.	11-22-37	3.75	4.15		
Monolith P. C., 8% pfd.	11-22-37	..	8	.50	Dec. 15
Monolith P. C., 1s tmtg.	.....				
Monolith Portland Midwest, pfd.[9]	10-20-37	2½	3	.25	Dec. 15

Stock	Date	Bid	Asked	Dividends	
National Gypsum, A., com.	11-22-37	6¼	6⅝		
National Gypsum 7% pfd.	.....			Q 1.75	Dec. 22
National Gypsum 5% pfd.	11-22-37	5½	6½	Q .25	Dec. 22
National L. & S., 6½'s, 1941[46]	11-10-37	80	..		
Nazareth Cement, com.[50]	11-15-37	6	8		
Nazareth Cement, 7%, pfd.[50]	11-15-37	70	..		
Newaygo P. C., pfd.[34]	11-20-37	91	..		
New England Lime, units[34]	11-10-37	10	5		
N. Y. Trap Rock, 7% pfd.[46]	11-10-37	80	..	Q 1.75	Oct. 1
North Amer. Cement, 6½'s, 1940[50]	11-15-37	70	..		
North Amer. Cement, 6½'s, 1943[50]	11-15-37	60	..		
North Amer. Cement, 6½'s, 1953[50]	11-15-37	25	..		
North Amer. Cement "B" pfd.[50]	11-15-37	5	..		
North Amer. Cement "A" pfd.[50]	11-15-37	3	5		
North Amer. Cement, com. A[50]	11-15-37	..	4		
North Shore Mat., 1st 6's[50]	11-13-37	40	..		
Northwestern P. C., units	.....				
Northwestern P. C., pfd.	.....				
Northwestern States P. C.[50]	11-15-37	23½	25½		
Ohio River S. & G., com.	11-24-37	..	1		
Ohio River S. & G., 1st pfd.	11-24-37	77	..		
Ohio River S. & G., 2nd pfd.	11-24-37	3	4½		
Ohio River S. & G., 6's[50]	11-16-37	10	..		
Oregon P. C., com.[50]	11-16-37	2	3		
Oregon P. C., 1st pfd.[49]	11-16-37	97	..		
Oregon P. C., conv. pfd.[50]	11-15-37	43	48		
Pacific Coast Aggr., new com.[49]	11-16-37	1.35	1½		
Pacific Coast Cement, com.[34]	Mkt.				
Pacific Coast Cement, 1st. pfd.[34]	Mkt.				
Pacific P. C., com.[49]	11-16-37	1½	3		
Pacific P. C., pfd.[49]	11-16-37	47	53		
Peerless Cement, com.[50]	11-15-37	2	3½		
Penn.-Dixie Cement., com.	11-25-37	4	4⅛		
Penn.-Dixie Cement, pfd., A	11-25-37	21	21¾		
Penn.-Dixie Cement, 6's A, 1941	..				
Penn. Glass Sand Corp., v.t.c.	11-22-37	12½	14	.50	Dec. 15
Penn. Glass Sand Corp., pfd.	11-22-37	117	..	Q 1.75	Jan. 1
4½'s, 1960	Called December 1				
Petosky P. C., com.[51]	11-20-37	6	7		
Republic P. C. com—new name Longhorn P. C. Co.					
Riverside Cement, A[9]	10-20-37	9	10		
Riverside Cement, B[9]	10-20-37	2	2⅝		
Riverside Cement, pfd.[49]	11-16-37	88	92	Q 1.50	Nov. 1
Santa Cruz P. C., pfd.	11-22-37	27½	..	.50	Oct. 1
Schumacher Wallboard, com.	11-22-37	2.10	3		
Schumacher Wallboard, pfd.	11-22-37	10	13½		
Signal Mt. P. C., com.[50]	11-15-37	..	4		
Signal Mt. P. C., pfd.[50]	11-15-37	55	..	4.00	Sept. 15
Signal Mt. P. C., units[51]	11-20-37	50	..		
Southern States P. C. cap.[34]	.....				
Southwestern P. C. units[50]	11-16-37	190	..		
Spokane P. C., units	.....				
Standard Parv. & Mat., com.[42]	11-18-37	3	3½		
Standard Parv. & Mat., pfd.[42]	11-18-37	21	23		
Standard Silica, com.	.....			.32	Dec. 1
Superior P. C., pfd.	.....				
Superior P. C., A[49]	11-16-37	36⅝	50		
Superior P. C., B[49]	11-16-37	11	17½	1.50	Nov. 29
Trinity P. C., units[50]	11-15-37	85	..		
U. S. Gypsum, com.	11-22-37	50	55	Q .50	Dec. 31
U. S. Gypsum, pfd.	11-22-37	156	165	Q .50	Dec. 24
				Q 1.75	Jan. 3
Volunteer P. C., 1st 7's, 1942[46]	11-16-37	3	3½	.10	Oct. 1
Volunteer P. C., units[46]	11-10-37	85	..		
Vulcanite P. C., com.[49]	11-12-37	6	..		
Vulcanite P. C., 7½'s, 1943[49]	11-10-37	99	..		
Wabash P. C.[50]	11-15-37	10	..		
Warner Co., ww. 1st 6's, 1944[46]	11-10-37	59	61		
Warner Co., com.[50]	11-15-37	3	5		
Warner Co., pfd.[50]	11-15-37	6	10		
Whitehall Cement Mfg., com.[34]	11-20-37	75	85		
Whitehall Cement Mfg., pfd.[34]	.....				
Wisconsin L. & C., 1st 7's, 1940[34]	11-10-37	80	90		
Wolverine P. C., com.	.....				
Yosemite P. C., 4% pfd.[49]	11-16-37	3	3½	.10	Oct. 1

Quotations by [9]A. E. White Co., San Francisco, Calif. [10]The Securities Co. of Milwaukee, Inc., Milwaukee, Wis. [37]Wise, Hobbs & Seaver, Inc., Boston. [42]Martin Judge Jr., and Co., San Francisco, Calif. [46]Nesbitt, Thomson & Co., Ltd., Toronto, Ont. [48]First National Bank of Chicago, Chicago, Ill. [49]Hewitt, Ladin & Co., New York, N. Y. [50]Rogers & Tracy, Inc., Chicago, Ill. [51]Paul D. Sheeline & Co., Boston, Mass. [34]Merrill, Turber & Co., Cleveland, Ohio.

RECENT DIVIDENDS ANNOUNCED

Alpha P. C., com.	$0.25	Dec. 21
Canada Cement, pfd.	1.25	Dec. 20
Kelley Island L. & T.	.40	Dec. 15
Lehigh P. C., com (Q)	1.00	Jan. 3
Lehigh P. C., 4% pfd.	.75	Dec. 23
Louisville Cement	.75	Dec. 23
Medusa P. C., com (Q)	1.50	Oct. 1
Michigan Silica Co., com. (Q)	.07½	Sept. 30
Monolith P. C., 8% pfd.	.50	Dec. 15
Monolith Portland Midwest, pfd.	.25	Dec. 15
National Gypsum, 7% pfd. (Q)	1.75	Dec. 22
National Gypsum, 5% pfd. (Q)	.25	Dec. 22
N. Y. Trap Rock, 7% pfd. (Q)	1.75	Oct. 1
Penn. Glass Sand Corp., v. t. c.	.50	Dec. 15
Penn. Glass Sand Corp., pfd. (Q)	1.75	Jan. 1
Standard Silica	.32	Dec. 1
Superior P. C., B	1.50	Nov. 29
U. S. Gypsum, com. (Q)	.50	Dec. 31
U. S. Gypsum, com. (E)	.50	Dec. 24
U. S. Gypsum, pfd (Q)	1.75	Jan. 3
Yosemite P. C., 4% pfd.	.10	Oct. 1

PACIFIC COAST AGGREGATES, INC., San Francisco, Calif., reports for the quarter ended September 30, 1937, a profit of $9500 after depreciation, depletion and minority interest, but before provision for income taxes, against a profit on the same basis of $89,214 in the June quarter, and $45,941 in September quarter of last year.

Third quarter results brought the company's profit before income taxes for the first nine months of 1937 to $48,488, against $21,011 in the corresponding 1936 period.

PENNSYLVANIA GLASS SAND CORP., Lewiston, Penn., reports for the nine months ended September 30, 1937, earnings of $580,476, compared with earnings of $347,782 in the like nine months of 1936. After allowance for preferred dividend, the nine months' earnings were equivalent to $1.38 per share on the common stock outstanding September 30, 1937.

NORTH AMERICAN CEMENT CORP., Albany, N. Y., reports for the 12 months ended September 30, 1937, net loss of $484,828 after normal taxes, depreciation, depletion, interest, etc., but before profit on bonds acquired, against net loss of $320,565 for the 12 months ended September 30, 1936.

UNITED STATES GYPSUM CO., Chicago, Ill., and subsidiaries report for the quarter ended September 30, 1937, shows consolidated net profit of $1,456,307 after depreciation, depletion, federal income taxes and provision for surtax on undistributed profits, equal, after dividend requirements on 7% preferred stock, to $1.11 a share on 1,193,156 shares of common stock outstanding.

This compares with net of $1,947,627, or $1.52 a common share, in the like 1936 quarter.

Nine months profit was $4,857,560, or $3.73 a common share, against $4,189,401 or $3.17 on common, in the like 1936 months.

Commenting on the report, company states that volume of new residential construction for the first half of the year as indicated by contracts awarded was substantially greater than that of the first half of 1936. Since the middle of the year, however, residential contracts awarded have declined and are currently approximately 25 percent lower than they were a year ago. Regardless of the current decreased building activity, there still exists a shortage in residential space as measured by normal requirements.

CONSOLIDATED CEMENT CORP., Chicago, Ill., reports earnings for the 12 months ending September 30 as follows:

	1937	‡1936
Net sales	$1,392,482	$1,360,277
Cost of sales	834,801	794,247
*Selling and administrative expenses, etc.	400,264	354,443
Operating profit	157,416	211,586
Bond and note interest	109,022	120,716
Bond discount and expense	10,489	10,478
Loss, assets retired, etc.	5,109	4,941
†Net income	32,796	75,452
Times charges earned	1.32	1.61
Earned per share, class A	$0.33	$0.75

No. of class A shares, 100,617.

*Including expense applicable to non-operating periods (less miscellaneous income).

†Before Federal income taxes, but after depreciation and depletion: 1937, $167,103; 1936, $174,365.

‡Revised.

ARUNDEL CORP., Baltimore, Md., sand and gravel, slag, and general contracting reports net profit, after depreciation, etc., but before federal income taxes:

Federal income taxes	1937	1936
3 mos. to Mar. 31	$201,083	(d)$115,572
3 mos. to June 30	435,431	359,408
3 mos. to Sept. 30	279,901	364,293
9 months	$916,415	$608,129

Quarterly Earnings, per share (in dollars):

	*1937	*1936	1935	1934
1st quarter	0.42	(d)0.24	0.37	0.31
2nd quarter	0.90	0.74	0.42	0.33
6 months	1.32	0.50	0.79	0.64
3rd quarter	0.57	0.76	0.45	0.54
9 months	1.89	1.26	1.24	1.18
Year		1.30	1.24	1.51

MICHIGAN SILICA CO., Rockwood, Mich., reports earnings for the 6 months ended June 30, 1937, as follows:

Sales	$118,155
Costs and expenses	85,978
Operating profit	32,177
Other income	465
Total income	32,642
Other deductions	5,764
Federal income tax	3,409
Net profit	23,469
Earned per share	$0.17

An initial dividend of 7½c per share was paid September 30.

As of June 30, 1937, current assets were $35,384 and current liabilities $28,267.

STANDARD SILICA CORP., Chicago, Ill., reports for the nine months ended September 30, 1937, a net profit of $82,708, equal to $2.10 per share. A dividend of 20c per share ($5 par) was paid September 15.

COTTON STATES PORTLAND CEMENT CO., Jackson, Miss., has filed with the federal securities commission a registration statement covering 30,000 shares of 6 percent cumulative preferred stock, $50 par, and 90,000 shares of no-par common stock. The company plans to offer the preferred and common for sale in units consisting of one share preferred and one share common at $50.10 per unit. The remaining 60,000 shares common, together with $20,000, would be paid to C. L. Till, promoter, on or before January 1, 1939, for 184 acres of land containing raw materials, located in Mississippi. There will be no underwriter. Proceeds would be used for operations.

NATIONAL GYPSUM CO., Buffalo, N. Y., reports for the quarter ended September 30, 1937, net income was $199,000, equal to 10c a share. Net income in the corresponding 1936 period was $389,049, or 26c a share. In the first nine months this year net profit was $709,780, or 41c a share, against $799,317, or 48c, on the corresponding 1936 period.

Petroleum Industry Advocates Asphaltic Concrete

SEVERAL GROUPS representing the petroleum industry recently called upon the California highway commission and state officers to reconsider present plans specifying the use of portland cement in completion of the Arroyo Seco highway in Los Angeles county. The spokesman claimed that from the standpoint of durability, non-skid properties, smooth riding and safety, asphaltic concrete will serve equally as well as portland cement concrete.

Cement Shortage In Argentina

ARGENTINE BUILDING has been so active recently that cement manufacturers were unable to fill orders. The Argentine Society of Engineers and the Argentine Chamber of Commerce approached the government with a request for permits to import 250,000 tons of foreign cement free of duty. Likelihood of any such action, however, has been lessened by a strike in the building trades, which has delayed some projects and has given cement manufacturers a chance to catch up on orders.

TRAFFIC and TRANSPORTATION

Proposed Rate Changes

THE FOLLOWING are the latest proposed changes in freight rates up to and including the week of November 13:

Central

52608. To establish on **lime**, common, hydrated, quick or slacked, C. L., from Gibsonburg, Durbin and Marble Cliff, O., groups to points in N. Y., Penn., N. J., Md., Me., W. Va., Va., Mass., Dela., N. C., etc., rates on basis of 110 percent and 120 percent of scale rates provided in I. C. C. Docket 16170 to Trunk Line and New England Freight Association territories, respectively, observing class rate origin and destination groupings.

52620. To cancel present rates on **lime**, common, hydrated, quick or slaked, also agricultural and fluxing lime, C. L., from Erie, Penn., to all points in C. F. A. territory, Classification basis to apply in lieu thereof.

52639. To establish on **limestone, agricultural**, unburnt, in bulk, in open top cars, C. L., from Carey, O., to Hudson, O., 90c per net ton. Route—Via C. & O. Ry., Upper Sandusky, O., and P. R. R.

52645. To establish on **sand**, naturally bonded moulding, in all kinds of equipment, carloads; sand (except industrial) in closed equipment, C. L., (See Note 3), but orders will not be accepted for closed and open top cars of less marked capacity than 60,000 lb. and 80,000 lb., respectively (**), from Nicker, Ind., to Chicago, Ill., 110c per net ton.

Route—Via N. Y. C. & St. L. R. R. direct.

52647. To establish on **crushed stone and crushed stone screenings**, in open top cars, C. L., (See Note 3), from Lorain, O., to Elyria, O., 40c per net ton. Route—Via B. & O. R. R. direct.

52648. To establish on **limestone**, unburnt, ground or pulverized, C. L., min. wt. 60,000 lb., from Carey, O., to Valley Falls, R. I., 410c per net ton.

52687. To establish on **limestone**, ground or pulverized, unburnt, C. L., min. wt. 60,000 lb., from Valmeyer, Ill.

(Rates in cents per net ton.)

To	Prop.	To	Prop.
Akron, O.	325	Lansing, Mich.	295
Ashtabula, O.	355	Louisville, Ky.	215
Battle Creek, Mich.	275	Michigan City, Ind.	235
Barberton, O.	325	Muncie, Ind.	235
Buffalo, N. Y.	395	Napanee, Ind.	255
Cincinnati, O.	255	Napoleon, O.	275
Cleveland, O.	325	Niagara Falls, N. Y.	395
Columbus, O.	285	Owosso, Mich.	315
Dayton, O.	255	Port Huron, Mich.	335
Detroit, Mich.	315	Pittsburgh, Penn.	355
Elkhart, Ind.	255	Richmond, Mich.	325
Evansville, Ind.	185	St. Clair, Mich.	325
Ft. Wayne, Ind.	255	Sandusky, O.	305
Goshen, Ind.	255	South Bend, Ind.	245
Indianapolis, Ind.	215	Toledo, O.	295
Kalamazoo, Mich.	275	Wabash, Ind.	235
LaFayette, Ind.	215	Winchester, Ind.	245
Logansport, Ind.	225	Williamsport, O.	285
Lancaster, O.	295	Youngstown, O.	355

Route: Via Mo. Pac. R. R. to E. St. Louis and such lines beyond as desire to participate in the rates.

52694. To establish on (a) **sand**, naturally bonded moulding, in all kinds of equipment, C. L.; sand (except naturally bonded moulding, ground or pulverized sand) in closed equipment, C. L.; (b) sand, ground or pulverized, in all kinds of equipment, C. L.; and (c) sand (except naturally bonded moulding; ground or pulverized sand) in open top equipment, C. L.; from Patoka, Ind., to Bedford and Bloomington, Ind., (a) 140c; (b) 154c and (c) 105c per net ton.

52706. To establish on **limestone**, ground or pulverized, unburnt, C. L., min. wt. 60,000 lb., from Hannibal, Mo., Quincy and Marblehead, Ill., to Napoleon, (1) 275c; Youngstown, O., (2) 355c; Elkhart, (3) 245c; Ft. Wayne, Ind., (1) 255c; South Bend, Ind., (3) (4) (5) (6) (7) 235c, and Richmond, Mich., (8) 325c per net ton.

(1) Route via Wab. Ry. direct.
(2) Route via Wab. Ry., Toledo, O., N. Y. C. or Ft. Wayne, Ind., P. R. R.
(3) Route via Wab. Ry., Reddick or Chicago, Ill., N. Y. C.
(4) Route via Wab. Ry., Chicago, Ill., G. T.
(5) Route via Wab. Ry., Steele or Chicago, Ill., M. C.
(6) Route via Wab. Ry., Pine, Ind., N. J. I. & I.
(7) Route via Wab. Ry., Logansport, Ind., P. R. R.
(8) Route via Wab. Ry., Chicago, Ill., G. T.

52729. To establish on **stone**, fluxing, furnace or foundry, melting and refractory (unburned), in bulk, in open top cars, C. L., from Scioto, O., to Alliance, Bentley, Girard, Hubbard, Leetonia, Lowellville, Newton Falls, Niles, Struthers, Warren, Youngstown, 105c; Canton and Massillon, O., 92c per gross ton.

52767. To establish on **roofing granules**, C. L., min. wt. 60,000 lb., to Edge Moor, Del., from Brittain, Copley, O., 386c; Darlington (Beaver Co.), Penn., and Phalanx, O., 370c per net ton.

52784. To cancel all commodity rates on **sand**, industrial, C. L., from Allegheny, Duquesne (Union), Junction Transfer, McKeesport, Millvale, Munhall (Union), and Pittsburgh (Mon Con), Penn., to destinations in the so-called Pittsburgh Checkerboard District, Versailles to Etna, Penn., both incl., also to destinations on the Union R. R., published in B. & O. R. R. Tariff I. C. C. 21187; also to cancel rate of 90c per net ton on naturally bonded moulding sand, from McKees Rocks, Penn., to Bessemer and Braddock, Penn., published in P. & L. E. R. R. Tariff B, No. 3513, Classification basis to apply in lieu thereof.

52803. To cancel rate of 276c per net ton on **crushed stone; limestone, agricultural** (not ground or pulverized), in bulk in open top cars, from Milwaukee, Wis., and points taking same rates to Van Wert, O., published in P. R. R. Tariff 68-R and other individual lines' tariffs, Classification basis to apply in lieu thereof.

52808. To cancel Item 975 of C. F. A. L. Tariff 105-U, publishing rates on clay, ground or prepared, **fuller's earth, kaolin, paper filler and silicon**, C. L., min. wt. 40,000 lb., from points in Mich., Ohio, Penn., etc., to points in Mich., Minn., Wis. and Ont. Classification basis to apply in lieu thereof.

52816. To cancel Item 4745 of C. F. A. L. Tariff 400-N, publishing rates on **stone**, rubble (except building stone), rough, broken, irregular pieces, not machined or tooled, C. L., min. wt. 60,000 lb., from St. Louis, Mo., East St. Louis, Ill., and upper east bank Mississippi River crossings to Battle Creek, Detroit, Flint, Grand Rapids, Jackson, Kalamazoo and Lansing, Mich., classification basis to apply in lieu thereof.

52818. To cancel Item 12500 of C. F. A. L. Tariff 218-K, and similar items in the tariffs of the individual C. F. A. lines, publishing rate of 252c per net ton on **stone**, rubble or spawls, in open top car equipment, min. wt. 40,000 lb., from New Castle, Penn., to Altoona, Penn., classification basis to apply in lieu thereof.

52819. To cancel Item 12455 of C. F. A. L. Tariff 218-K, publishing rates on **stone**, natural, N. O. I. B. N. in Official Classification, viz., rubble in open top car equipment, min. wt. 40,000 lb., from stations in Rate Groups 11704, viz., St. Louis, Mo., E. St. Louis, Ill., etc., to Albany, N. Y., Baltimore Md., Belington, W. Va., Boston, Mass., Cumberland, Md., Hagerstown, Md. (via N. & W. Ry.), Newport News, Va., New York, N. Y., Norfolk, Va., Philadelphia, Penn., Rochester, N. Y., Rockland, Me., Strasburg, Va., Syracuse and Utica, N. Y., classification basis to apply in lieu thereof.

52907. To establish on **limestone**, unburnt, ground or pulverized, C. L., min. wt. 60,000 lb., from Carey, O., to destinations in Michigan, rates as shown in Exhibit. Routing: Routes published in B. & O. Ry. Co. Freight Tariff 1951-C to apply.

Exhibit

Representative proposed rates, in cents per net ton, from Carey, Ohio, to (representative) points in Michigan:

To	Prop.	To	Prop.
Ada	195	Marine City	185
Allegan	185	Midland	195
Annpere	165	Mulliken	185
Bad Axe	205	North Morenci	150
Big Rapids	215	Ottawa Lake	130
Blissfield	135	Pinckney	165
Charlotte	170	Quincy	165
Coldwater	170	St. Johns	175
Conklin	205	Sand Creek	145
Detroit	155	Sibley	150
Eaton Rapids	170	Sturgis	165
Grand Haven	205	Temperance	135
Grand Rapids	195	Valley Centre	185
Harvard	205	Williamston	170
Howard City	205	Woodbury	185
Kalamazoo	175	Ypsilanti	150
Ludington	235		

New England

42894 (21-R). **Ground agricultural stone**, min. wt. 40,000 lb., Rumford, Me., to Boston, Mass. Proposed—16½c; present—22c. Reason: To reestablish a rate which was cancelled in error.

42973. To cancel Item 410 of B. & M. I. C. C. A2899, naming rate of 17c on **neutralized spent lime**, from Cumberland Mills, Me., to Piers 18 and 19, North River, N. Y., permitting class rates to apply in lieu thereof. Reason—E. S. S. Lines have requested cancellation of this rate.

42974. **Crushed stone**, A; **crushed stone**, coated with asphalt, B; min. wt. 50 net tons, except that when cars of lower capacity are furnished for carriers' convenience, the min. wt. will be the marked capacity of the car. Winchester, Mass., to Peterboro, N. H. Present—A, $1 net ton; B, $1.10 net ton. Proposed—A, 70; B, 75. Reason—To enable B. & M. to receive haul on this material.

Texas-Louisiana

2647-TX (File 10029-TX). **Lime and cement**—mixed C. L., between points in Texas. Proposition from shipper to publish a new item in Tariff 2-M under "Exceptions to Western Classification," reading substantially as follows:

"Exception to Rule 10 of C. W. C. on

*Note—The oil, tar and/or asphaltum not to exceed 10% by weight of the commodity shipped, the shipper to so specify on shipping orders and bills of lading.

**When a shipper orders a car of above mentioned marked capacities or greater, and the carrier is unable to furnish car ordered and furnishes a car of greater capacity than that ordered, the min. wt. for the car furnished will be that which would have obtained had the car ordered been furnished and used.

Note 1—Minimum weight marked capacity of car.

Note 2—Minimum weight 90% of marked capacity of car.

Note 3—Minimum weight 90% of marked capacity of car, except that when car is loaded to visible capacity the actual weight will apply.

lime. Where two or more commodity rates on lime are in effect between the same points based on different minimum weights, the provisions of Section 1 of Rule 10 of the current W. C. will not apply in connection with rates carrying minimum weights of 50,000 lb. or greater."

The purpose of this proposal is to provide an exception to the present rules to the effect that when lime is shipped in mixed carloads with cement, and there are two carload rates on the lime, the rate on the lime in the mixed C. L. will be the higher of the two C. L. rates.

Trunk

Sup. 1 to 36329. (A) **Sand** (other than ground or pulverized or naturally bonded moulding) in open top cars without tarpaulin or other protective covering. (B) Sand (other than ground or pulverized) in closed cars. (C) Sand naturally bonded moulding, in open or closed cars, (See Note 3), from Irvine Mills, Olean and Carrollton, N. Y., to Orillia, Ont., on (a) $3.75; (b) and (c) $4.05 per net ton, in lieu of present class rates.

36349 (Sup. 1). To cancel commodity rates on **sand and gravel** from Mt. Arlington, N. J., to points in Trunk Line and C. F. A. territories published in D. L. & W. R. R. I. C. C. 23559 and W. S. Curlett's Tariff I. C. C. A-520. Reason—No present or prospective movement.

36385. **Limestone**, crude, fluxing, foundry and furnace, C. L., (See Note 3), from Howard, Penn., to Riddiesburg, Penn., $1.13 per gross ton in lieu of present 6th class rate 16c per 100 lb.

36376. **Limestone**, ground or pulverized, in straight or mixed C. L., min. wt. 60,000 lb., from Norfolk, N. Y. (N. & St. L. R. R.), to stations on the D. & H. R. R. in New York state, rates ranging from $1.55 to $1.95 per net ton. Reason—Based on I. C. C. Docket 25220 scale.

36377. (A) **Sand** (other than ground or pulverized or naturally bonded moulding), and **gravel**, in open top cars without tarpaulin or other protective covering, C. L.; (B) **sand**, naturally bonded moulding, in open top or closed cars, C. L., from Slatington, Penn., to Boyertown, Penn. (A) $1.20, and (B) $1.30 per net ton, in lieu of present sixth class rates. Reason—Based on industrial sand scales.

36379. (A) **Sand** (other than ground or pulverized or natural bonded moulding), in open top cars without tarpaulin or other protective covering, C. L. (B) **Sand** (other than ground or pulverized or natural bonded moulding), in closed cars or in open top cars with tarpaulin or other protective covering, C. L., (See Note 3), from Pulaski, N. Y., to Blossberg and Troy, Penn.: (A) $1.70, (B) $1.80, and to Williamsport, Penn., (A) and (B) $1.85 per net ton, in lieu of present sixth class rates.

36395. Cancel commodity rates on **lime** (calcium), carbonate of, recarbonate waste (whiting substitute), precipitated lime, C. L., and calcium carbonate of C. L., from Luke, Md., and Piedmont, W. Va., to points provided in Wn. Md. Ry. I. C. C. 8222 and from Luke, Md., to C. F. A. territory published in Agent Curlett's Tariff I. C. C. A-520, in lieu of present sixth class rates. Reason—No present or prospective movement.

36397. (A) **Sand** (other than ground or pulverized or natural bonded moulding), in open top cars without tarpaulin or other protective covering, C. L., and (B) **sand** (other than ground or pulverized or natural bonded moulding) in closed cars or in open top cars with tarpaulin or other protective covering, C. L., (See Note 3), from Pulaski, N. Y., to Nunda, N. Y.

(A) $1.60 per net ton and (B) $1.70 per net ton, in lieu of present 6th class rate 18c per 100 lb. Reason—Based on industrial sand scales.

Southwestern

12557. **Lime**, Alabama, Indiana, Ohio, etc., to Arkansas, Nebraska, Wyoming, etc. To eliminate application of Rule 10 of Consolidated Classification (mixed C. L. rule) in connection with rates on lime, C. L., contained in SWL Tariff 227-A.

12598. **Lime, common, viz.; Lump, crushed, pulverized or hydrated**, lime rock, Colorado to Amarillo, Tex. To establish commodity rates of 22½c per 100 lb., min. wt. 30,000 lb., and 18c per 100 lb., min. wt. 50,000 lb., on lime, common, viz.: Lump, crushed, pulverized or hydrated, in straight or mixed carloads from Lime Rock, Colo., to Amarillo, Tex.

12599. To establish the Class 27½ rating on mineral wool, plain or saturated, min. 24,000 lb., subject to Rule 34 and Class 35 on mineral wool, metal reinforced, min. wt. 30,000 lb., subject to Rule 34, between points in Colorado and Wyoming and points in the southwest published in SWL Tariff No. 61-C, Agent Peel's I. C. C. No. 2902.

12676. **Silica sand**, Hermann, Pacific, Gray Summit and Klondike, Mo., to Tulsa, Okla. To establish the following rates on silica sand, carloads, to Tulsa, Okla.: From Hermann, Mo., $2.18; Gray Summit and Pacific, Mo., $2.29; Klondike, Mo., $2.39 per net ton. Min. wt. as per SWL Tariff No. 162-L.

Western

E-41-229. **Limestone**, ground, C. L., min. wt. as shown in Item 5610 of WTL Tariff 18-O, from Weeping Water, Neb., to Chicago, Ill. Rate, present, 16c per 100 lb. Proposed, 13¾c per 100 lb.

E-41-230. **White sand (silica)**, C. L., (See Note 3). In no case shall the min. wt. be less than 40,000 lb., from Crystal City-Festus, Gray Summit, Hermann, Klondike, Pacific and Sand Pit, Mo., to points in Indiana and Ohio. Proposed—To establish through rates based on the mileage scale shown in I. C. C. Docket 22907, using the average distance from the origin points shown above, in arriving at the proposed rates.

E-41-231. **Filtering sand and gravel**, C. L., (See Note 1), from Muscatine, Ia., to Hine, Mo. Rates: Present—$2.38. Proposed —$1.76 per net ton.

E-41-232. **Sand**, silica, in box cars, C. L., as described in Item 30, S. W. L. Tariff 162-L, min. wt. as shown in Item 60, S. W. L. Tariff 162-L, namely 90 percent of the marked capacity of the car, from Pacific Gray Summit, Hermann and Klondike, Mo., to Memphis, Tenn., and New Orleans, La. Rates:

	To Memphis, Tenn.		To New Orleans La.	
From	Pres.	Prop.	Pres.	Prop.
Pacific, Mo.	301	255	386	370
Gray Summit, Mo.	312	255	386	370
Hermann, Mo.	323	255	394	370
Klondike, Mo.	323	255	394	370

Sup. 1 to E-41-227. **Stone**, crushed, limestone, broken, crushed or ground, C. L., (See Note 3), but in no case less than 40,000 lb., from St. Louis, Mo., and E. St. Louis, Ill., to as shown in original application (Application Bulletin No. 4643, dated Oct. 12, 1937), also to representative points shown below:

	Present	Proposed
Bemidji, Minn.	34	23
Blue Earth, Minn.	24	13
Grand Rapids, Minn.	33	22
Pipestone, Minn.	27	16
Sleepy Eye, Minn.	27	16
Winnebago, Minn.	24	13

E-41-234. **Stone**, C. L., as described in Item 5310 of W. T. L. Tariff 50-P, from Group F (St. Louis), to stations in Iowa in Groups 22 to 27, inclusive. Rates to representative points:

	Pres.	Prop.
Group 22—Creston	$4.20	$2.50
Group 23—Shenandoah	4.20	2.50
Group 24—Manning	4.40	2.50
Group 25—Lake City	4.40	2.50
Group 26—Rock Rapids	5.20	2.80
Group 27—Hawarden	5.20	2.80

E-43-51. **Stone**, C. L., as described in Item 8150 of W. T. L. Tariff No. 18-O, from Cold Springs, Rockville, St. Cloud and Sauk Rapids, Minn., to stations in Kansas and Missouri. Proposed, to cancel rates published in Item 8150 of W. T. L. Tariff 18-O, allowing class or combination rates to apply in lieu thereof.

E-151-18. **Feldspar**, C. L., from Divide, Colo., to representative points. **Rates:**

Present (in cents per 100 lb.)—To:
Group 1 (Miss. River) (D) 31¾.
Group 2 (Peoria) (D) 35¼.
Group 3 (Chicago) (D) 39¾.
Group 4 (St. Paul) (D) 39¾.

Proposed (in cents per ton of 2,000 lb.—To:
Group 1 (Miss. River) (1) (C) 485 (A) 575.
Group 2 (Peoria) (2) (B) 695.
Group 3 (Chicago) (A) 695.
Group 4 (St. Paul) (A) 725.

(1) Applicable only on traffic destined to points east of the Ill.-Ind. state line.

(2) Will not apply to where rates are provided in Item 3072 of W. T. L. Tariff 111-I.

(A) Min. wt. marked capacity of car.
(B) Min. wt. marked capacity of car, but not less than 60,000 lb.
(C) Min. wt. 80,000 lb.
(D) Min. wt. 50,000 lb.

Southern

15889. **Lime**, C. L. Establish 550c, C. L., min. wt. 30,000 lb., and 440c net ton C. L. min. 50,000 lb., from Knoxville, River Front Extension and South Knoxville Extension, Tenn., to Johnstown, Penn.

15892. Provide the following rule in S. F. T. B. **sand and gravel** Tariff 388-A, for account of the C. of Ga. Ry.:

Where carrier for its own convenience furnishes a car of greater marked capacity than ordered by shipper, such car may be used on the basis of the C. L. min. wt. applicable on a car of the marked capacity ordered by shipper, but not less than the min. wt. provided for an 80,000 lb. car, actual weight to apply when greater than C. L. min. wt. Applies only when shipments tendered could have been loaded in cars of capacity ordered by shipper.

15912. **Lime** (calcium) acetate of, C. L. Establish all-rail from Lyle, Tenn., to Philadelphia, Penn., 52 cents; Parlin and Edgewater, N. J., 54c; Boston, Mass., 58c cwt.

15952. **Talc**, C. L., min. 50,000 lb. Establish 746c net ton from Cartersville, Chatsworth, Canton, Jasper, Ga., Kinsey, N. C., and Ranger, N. C., to Edgewater, N. J.

Intrastate Freight Rates Reduced for Aggregates

MISSISSIPPI RAILROAD COMMISION recently ordered a slight decrease in intrastate freight rates on sand and gravel after a 60-day investigation at the request of the Louisville and Nashville railway and the Southern railway. The railroads had filed petitions in an attempt to raise rates. Present interstate rates are 25 per cent higher than intrastate rates. The petitioning railways contended that the lower intrastate rates are prejudicial on sand and gravel pits along their lines in Alabama and other states and that as a result practically all of the carrier business was from pits in Mississippi. The Mississippi State Highway Department opposed an increase, contending that it would add $1,000,000 to the cost of the highway construction program now in progress in Mississippi. The commission increased the sand and gravel rates between some points and reduced them between others with a net result of a reduction of two per cent.

Digest of Foreign Literature

By F. O. ANDEREGG,
Consulting Specialist in Building Materials, Newark, Ohio

The Relation Between Cement Fineness and Concrete Impermeability—Slabs of concrete or mortar were made up 3x12x12 in. and after suitable curing were subjected to eight atmospheres (120 p.s.i.) water pressure. Two cements were used, a rather coarsely ground portland cement and a trass cement whose size distribution approached logarithmic. The grading of the aggregate was concave upward when plotted on a log. paper (cumulative percent below against log. d). Various mixtures of Rhine sand with rounded grains and crushed rock sand with sharp grains were tried, and it was found that the lowest permeability with the portland cement was obtained when from 20 to 30% of Rhine sand was replaced by rock sand. With the trass cement the optimum lay between a replacement of from 10 to 20%. The amount of water passing through slabs of trass cement, because of its better packing, was about one-third that passing through specimens made with the coarsely ground cement. The finer ground trass cement, of course, required somewhat greater amounts of mixing water. The water requirement of both increased as Rhine sand was replaced by rock sand, indicating that permeability is not wholly determined by the water cement ratio. Generally, both cements when mixed with between 0.76 and 0.80 of their volume of water permitted least permeation. This work was done by Hanns Kilb. *Zement* (1937) 26, No. 5, p. 69.

Development of Highway Cements—H. E. Schwiete of the Kaiser Wilhem Institute for Silicate Investigation has reached some interesting conclusions as to methods of improving the quality of road cements. In the first place the chemical composition of the cement is quite important; as is well known, the tricalcium aluminate constituent should be kept to a minimum to reduce shrinkage and the clinker should preferably contain a large amount of tricalcium silicate, since not only is the strength enhanced but shrinkage is reduced, at least after 28 days' storage. An important factor in determining the quality of the cement is the fineness of grinding. A certain cement was ground to different degrees of fineness, the residue on the 176-mesh sieve ranging from 5 to 19%, resulting in a reduction of compressive strength of 20%, of flexural strength only 10%, of specific surface 23%, of 28-day shrinkage 30%, and of modulus of elasticity 18%. The last two properties far outweigh the loss in strength, and these may be combined to give a "crack formation factor" decrease of 35%. Schwiete is inclined to recommend grinding to leave a residue of about 15% on the 176-mesh sieve, which is somewhat coarser than most cements are ground. (One important factor has been neglected in drawing this conclusion; viz., the size distribution of the cement. It is readily possible to regrind certain poorly ground cements quite a bit finer and yet secure a reduction in shrinkage tendency by securing a grading of the cement which will pack better.)

Schwiete reports his experience with an extravagantly advertised admixture which was supposed to be added to any portland cement to make it resistant to storage, absolutely sound, reduce the heat of setting, increase standard tensile and compressive strengths, reduce shrinkage, render completely impermeable and resistant to dilute acids, combine with the free lime, have especially good elasticity properties and improve bonding power. Chemical, analytical and X-ray examination indicated the admixture to be from 50 to 60% fine quartz, from 20 to 30% blast furnace slag and 20% of other stone dust. On adding one-half volume to the cement in making a standard test, it is true that some improvement in strength was obtained by filling more of the voids. But on making a direct comparison with an equal admixture of finely ground quartz, practically identical results were obtained in the standard German tests. The addition of an equal volume of portland cement, however (and this would cost less than the amount of admixture recommended), gave much higher strengths still. When tests were made with plastic mortars, with 30% of the cement replaced by the admixture, a considerable reduction in strength was found (18% avg.) While the addition of the admixture brought about some reduction in the modulus of elasticity, the shrinkage was considerably enhanced, so that tendency towards cracking was also raised. *Zement* (1936) 25, No. 46, p. 791.

Hardness of Burning and Clinker Quality—A contribution of the knowledge of clinker formation from sulfide containing slags has been made by G. Mussgnug. A raw mix made from slag was burned and samples were removed from the kiln after it had been pretty well sintered, hard burned and very hard burned. The samples were all cooled and ground in the same way. The only variation in the chemical composition was in the SO_3 content by means of which the degree of burning could readily be estimated. Incidentally, because of loss of sulfate on hard burning, it is possible to prepare a thoroughly burned clinker containing more free lime than one less hard burned. The unit weight, determined with the smallest grain which could be handled, also varied appreciably with the degree of burning, although the specific gravity of the ground cement changed but little.

The samples were ground with different amounts of gypsum, either 3% being added or just enough to make the total SO_3 come to 2.5%. The setting times did not vary greatly although gypsum was more effective in controlling it than the sulfate in the clinker. The hardest burned material failed to develop on earth-dry mixes as high an early strength as those burned less hard, although little difference could be detected at 28 days; however, in plastic mortar specimens little variation in early strengths was observed. Some variation in workability was observed, the harder burned cements requiring more water to reach a given flow. A small increase in shrinkage was observed as more gypsum was added, but otherwise the distinctions were not significant up to 90 days. The amount of gypsum added seemed to be the chief factor in heat of hydration, although the hardest burned clinkers developed less heat than the others. The extra burning caused only a slight reduction in alkali content.

Petrographic examination of thin sections from these clinkers disclosed much better development of tricalcium silicate crystal structure in the hardest burned material, while in the least well burned cement not only were the trisilicate crystals more rudimentary, but also numerous dicalcium silicate crystals were found. At the same time, free lime determinations ranged from about 1.3% on the two harder burned materials to above 5% for the cement containing the di-silicate crystals.

The conclusion reached was that on burning cement clinker from a raw material containing slag, care should be taken not to carry the burning too far in trying to eliminate sulfur. Not only is ring formation to be guarded against, but he believes the quality of the cement is not helped. He believes that a fairly well burned clinker where true equilibrium is not reached is apt to yield a more reactive cement. In other words, the physical condition of the tricalcium silicate is a factor to be considered, the denser it becomes the less reactive.

SUBSCRIPTION RATES

1 year $2 . . . . 3 years $5

Rock Products

205 WEST WACKER DRIVE • CHICAGO

Gentlemen: Enclosed find $_____ in payment for subscriptions to ROCK PRODUCTS as follows:

Name _____
Position _____
Company _____
Address _____
City and State _____
No. Years _____ ☐ New ☐ Renewal ☐ Extension

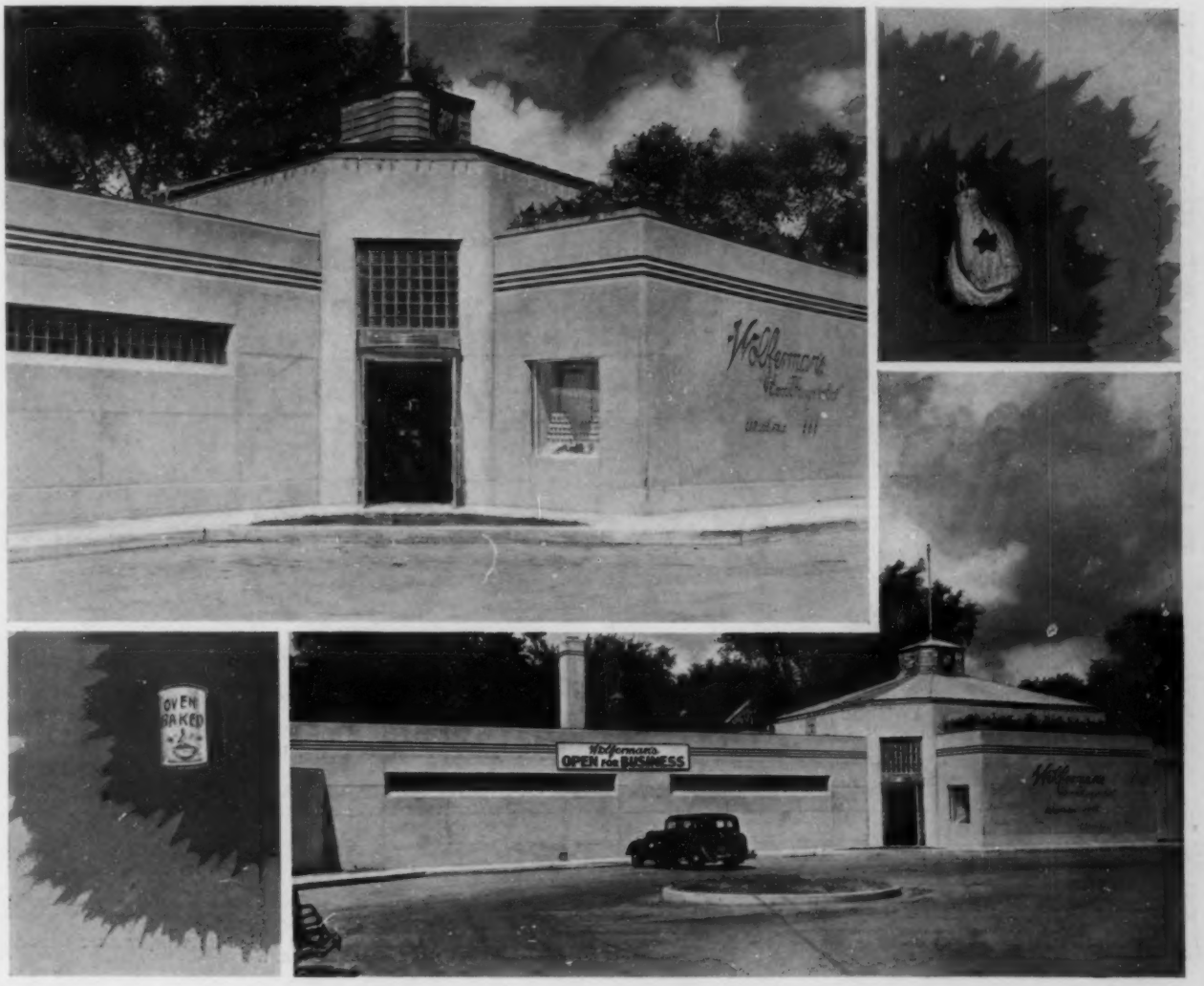
Name _____
Position _____
Company _____
Address _____
City and State _____
No. Years _____ ☐ New ☐ Renewal ☐ Extension

Name _____
Position _____
Company _____
Address _____
City and State _____
No. Years _____ ☐ New ☐ Renewal ☐ Extension

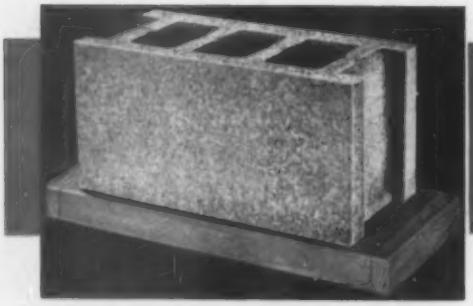
Senders Name _____
Address _____

Concrete Products
Cement Products
TRADE MARK REGISTERED WITH U. S. PATENT OFFICE

Ready-Mix Reaches Into A New Field



Food shop in Kansas City, Mo., built of "architectural" concrete for permanance and beauty. Concrete was furnished by the Ready-Mixed Concrete Co., and deliveries of 1160 cu. yd. were made over a span of 100 working days in trucks from a central mixing plant. The mix was 312-lb. coarse aggregate, 237-lb. sand and 94-lb. cement, with 5.8 sacks of cement to the cubic yard of concrete and 6½-gal. of water to the sack



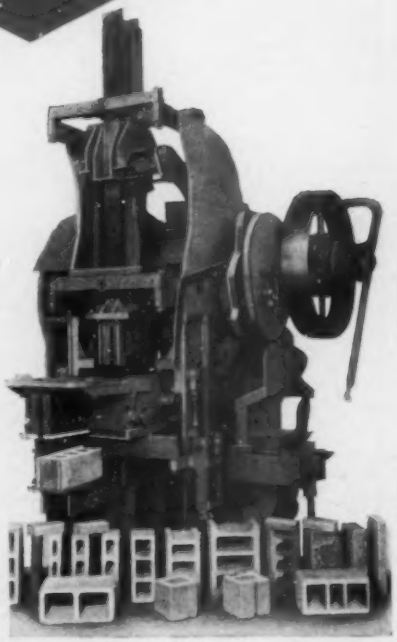
Units with FULLY PRESSED TOP are made only on Besser Plain Pallet Strippers using one set of either plain wood or steel pallets for all sizes.

BETTER OPPORTUNITIES WITH BESSER PLAIN PALLET STRIPPERS

It is easy to Understand Why BESSER Equipped Plants Have Shown Such Growth and Prosperity

A great number of concrete products plants have been able to expand and extend business and increase incomes because Besser Plain Pallet Strippers have eliminated the old burden of pallet expense, and also lowered general operating and labor cost. FULLY PRESSED TOP units have greatly increased the use of concrete masonry in the higher class construction field and this means increased sales volume. A Besser means better business.

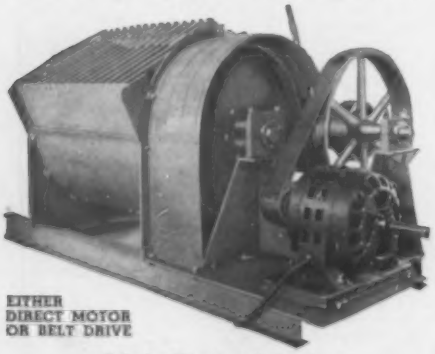
Mr. Morry Holzman of the Best Block Co., Milwaukee, Wis., showing seven sizes of FULLY PRESSED TOP units all made on ONE SET OF PLAIN PALLETS.



BESSER BATCH MIXERS

In All the Standard Capacities

5, 12, 18, 25, 30, 40 and 50 Cubic Feet



EITHER DIRECT MOTOR OR BELT DRIVE

Ask for Illustrated Catalog

BESSER PLAIN PALLET STRIPPERS

FULLY AUTOMATIC—3 Models—Capacities: 2000 to 4000 units per day.
SEMI-AUTOMATIC—4 Models—Capacities: 1000 to 2000 units per day.
POWER OPERATED with Hand Controls—2 Models—Capacities: 500 to 1000 units per day.
MULTI-MOLD—Hand Operated—Capacities: up to 300 units per day. For manhole blocks, brick slabs and small cored units.
AUTOMATIC BRICK MACHINES—Capacities from 10,000 to 50,000 units per day. For brick, slabs, coal cubes and other small units.

Besser Plain Pallet Strippers are made under one or more of the following Patents of which Besser Mfg. Co. is sole owner.

No. 1,472,399 by S. H. Pettengill
No. 1,572,305 by A. P. Nelson
No. 1,699,218 by J. H. Besser
No. 1,706,647 by J. H. Besser

These are the only patents ever granted on concrete stripper block machines using plain pallets, and they completely cover the basic plain pallet stripper principle. Other patents pending on improvements. No firm or individual is licensed or allowed to make machines under any of these patents.

Write for Besser Plain Pallet Stripper Catalog

BESSER MANUFACTURING CO.

COMPLETE EQUIPMENT FOR CONCRETE PRODUCTS PLANTS

Complete Sales and Service on BESSER, ANCHOR, CONSOLIDATED, IDEAL, HOBBS, UNIVERSAL, PORTLAND

212 37TH STREET **ALPENA, MICHIGAN**

EVERY CONCRETE PRODUCTS PLANT NEEDS A BESSER PLAIN PALLET STRIPPER

If It Is Concrete

KIRKHAM MAKES IT

By STAFF EDITOR

CONCRETE MASONRY HOUSE CONSTRUCTION has gained momentum in many large communities due to the progressive efforts of manufacturers of concrete products, assisted by the small concrete contractor or builder, and national advertising which has interested the public in fireproof, permanent types of construction.

In some of the smaller cities where concrete masonry for small home construction is looked upon as unusual, it is sometimes difficult to get the support and co-operation of the small builder, who usually is a carpenter contractor. Under these conditions, the manufacturer of concrete products will find opposition and not too much encouragement. His road is a rocky one to be sure, but by properly merchandising the concrete house the contractor or builder can be converted.

That is the condition in Topeka, Kan., and the problem faced by the Kirkham Concrete Products Co., a concern which has had a remarkable growth in the past two years, and is now preparing to enter the low cost housing field. Since this company already has sold several concrete houses, built of sand and gravel concrete masonry surfaced with stucco, it would seem to indicate that the concrete house can be put over even in the opposition's stronghold. In anticipation of wider markets, this plant has quadrupled its capacity within the last year, and just recently has begun the manufacture of cinder block.

J. E. Kirkham, general manager of Kirkham Concrete Products Co.

J. E. Kirkham, general manager, has been a contractor since 1920. From a modest beginning two and a half years ago, with a concrete block plant having a capacity of 600 to 700 units per day, he now has a new plant of 3000 unit capacity. He also has added a variety of plasters, stuccos, insulation and allied building materials which will bring him a larger percentage of the total outlay for building materials on a construction job than the expenditure allotted for the masonry units themselves. He has sold construction materials for houses where the amount apportioned for concrete masonry would be only 20 percent of the total, and has found the job profitable because he is prepared to sell many of the other building materials which go into the job.

Produces Other Allied Products

In addition to his entry into the manufacture of lightweight units this year, Mr. Kirkham has expanded his activities, and is now a manufacturer of crushed stone, concrete pipe and ready-mixed concrete.

The enlarged block plant was built in 1936 on property leased from the Kansas Sand Co., which supplies the sand

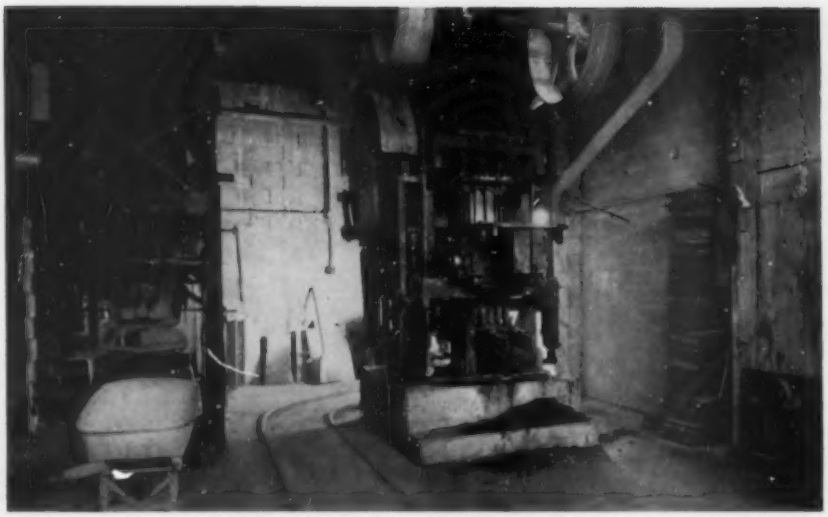
Left: Ready-mix concrete plant. Center: Recently modernized concrete products plant. Right: Small stone plant erected to produce stone aggregates for the manufacture of concrete pipe and for commercial sale

and gravel aggregates. These aggregates are trucked to the concrete products plant from the sand company bins or stockpiles, and are placed in bins by a Jeffrey bucket elevator, 50-ft. centers. Cinders are shipped by rail from Kansas City to the plant, and elevated to bins. Aggregates are placed by a swing chute in the proper compartment of the 100-ton capacity, three-compartment bin.

Units are manufactured on an Anchor block machine, and a new Besser fully-automatic 9-bar stripper machine. Capacity of this machine is 6½ units per minute. Among the building units are the 4-, 8- and 12-in. gravel and cinder concrete blocks, concrete brick, catch basins and manhole blocks. To expedite curing, high early strength cement is used in the manufacture of the units. All units are steam-cured in the winter.

Back-up block has represented the largest volume of sales in Topeka, but several small homes and some in the $20,000 class are built with sand and gravel block above-ground construction, concrete joists, and an exterior of waterproof portland cement stucco. With the addition of cinder products, and the manufacture of concrete joists, the company is now equipped to sell the complete concrete home with exposed masonry. The Portland Cement Association literature, and lists of those responding to its national advertising campaign are being used to advantage in promoting the sale of concrete homes.

Recently, a small one-story concrete house was built on the company property, similar in design to those built at Norrisville, Tenn., on the Norris Dam project, which was sold to an employe for $1000. This house has five rooms, including a bath, and while not incorporating all the conveniences desired by the average wage earner, does illustrate the possibilities of a low-cost home. The house is 25- x 25-ft., of cinder block construction, and is coated with waterproof cement paint.



New automatic tamping machine has made possible a large increase in plant capacity in the manufacture of masonry units

Ready-Mix Concrete Plant

The ready-mixed concrete is produced in a central mixing plant built adjacent to the stockpiles of the sand and gravel company. It consists essentially of a Blaw-Knox 50-ton, two-compartment bin, a Blaw-Knox batcher and a 28-S Chain-Belt mixer. Sand is placed into the bin by the sand company's crane, and stone is trucked to the plant. Concrete is mixed according to A.S.T.M. specifications. The plant is enclosed for winter operation. Deliveries are made in regular 2-cu. yd. dump trucks.

The Kirkham Concrete Products Co. had been making ready-mixed concrete on a small scale for some time before construction of the new plant, utilizing the bins of the concrete products plant, and the 2½-cu. yd. Besser mixer as a central concrete mix plant. The mixer is equipped to serve the block equipment or to chute the concrete direct to trucks. Occasionally, small orders or sales taken in the winter months will be filled from the concrete products plant when the quantity does not warrant starting up the new central concrete mix plant.

A crushing plant was built this year having a 125-ton daily capacity to produce aggregate for the manufacture of concrete pipe, for coarse aggregate in the ready-mixed concrete, and for sale as commercial stone. Generally stone is purchased from truckers delivering to the plant, with occasional deliveries of sized stone from other quarries in filling a particular specification.

Trucks discharge to an Austin-Western 9- x 40-in. jaw crusher, the throughs being elevated by an Austin-Western bucket elevator to a home-made triple-deck vibrating screen. Oversize returns to a 9x20-in. jaw crusher. A 1½-in., a ¾-in., ⅛-⅜-in. stone and dust are produced. The chats (⅛ to ⅜-in.) are used in the manufacture of concrete pipe. The fines are high in lime and are sold as agricultural stone. Occasionally, some of the dust is used in the manufacture of concrete products when the sand is deficient in fines. The stone plant is powered by a 75-hp. gasoline engine.

Concrete pipe are manufactured in the open. Note improvised vibrator for vibrating concrete pipe forms to produce quality products

Reinforced concrete pipe of highway specification, from 12- to 36-in. in diameter, is manufactured in an open plant using stone aggregate. The pipe is all hand-poured and vibrated by a portable home-made device imparting a movement to every portion of the form at one setting.

A reinforced concrete well-casing is being manufactured, usually in 36-in. diameters, as a sideline to the manufacture of concrete pipe. The well-casing consists of a series of regulation size concrete pipes which have been made porous in the manufacturing process to allow the passage of water.

Manufacture Porous Well Casings

These casings are poured in the regulation mold, using standard portland cement, a ¼-¾-in. stone aggregate and no fines. These units are cast with a 2-in. slump concrete using 6 gal. of water to the sack of cement, and a rich cement paste, with two barrels of cement to a cubic yard of stone. The lower end of the pipe form is hand-tamped lightly, and when the form is completely filled the casing is allowed to cure. This product is not vibrated, but has the standard reinforcing for a 36-in. pipe to give strength. The resultant "well casing" is so highly porous to water that its passage through the walls is practically unhindered. Other products manufactured in the pipe plant are hog and cattle water troughs cast to special order.

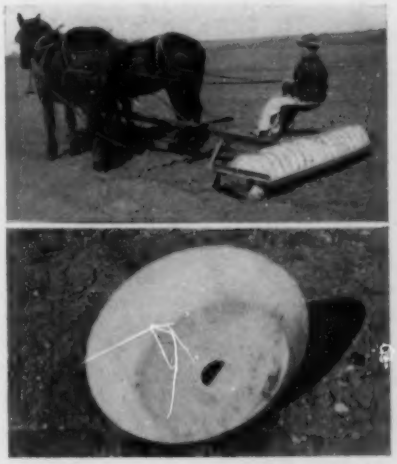
Market has been found for porous well casings, cast without the use of fine aggregate

Unusual Products

A special order, quite unusual for a concrete products plant, was filled recently when 15 "deadmen", weighing 1500 lb. each, were needed in a hurry by the Kellner Jetty Co., for Rock Island railroad revetment work in the Kaw River near Willard, Kan. These units were cast singly on a flat car at Topeka by the Kirkham Concrete Products Co. Twelve of the units were cast one day, three on the next, and the car was rushed to the job on the third day. The use of high early strength cement on this job facilitated early removal of the forms and shipment to the job.

A special order filled by the Kirkham Concrete Products Co. for concrete "deadmen" units made with high early strength cement, were poured on railroad flat cars

Another product that has been a good seller this past summer is the reinforced concrete packer wheel. These concrete wheels or discs are arranged in a series to make a "land packer" which is used by the farmer to break up clods of earth before and after seeding. The "land packer" is a development of the Grundeman Construction Co., Holton, Kan. Through radio advertising on farm programs by the latter concern, the farmers became very much interested in this new implement during the past season, with the result that three carloads of concrete packer wheels were shipped. These units are an excellent product to manufacture during the winter months, to keep the men busy and in preparation for the rush season. Concrete packer wheels are cast in one piece on a vibrating machine. Hard, durable siliceous sand and gravel aggregates, and high early strength portland cement, with 4½ to 5 gal. of water per sack are used in making the concrete mixture. After a 12-hr. drying period, they are cured for 21 days, being submerged in water at 80-deg. F., for seven days. The product has a compressive strength of 6000 p.s.i. after seven days, and 7000 p.s.i. after 28 days. The wheel is 16-in. in diameter and 5-in. thick with a weight of 57 lb.



Above: How concrete land packers are used. Below: Close-up of one of the units

Other products are a portland cement stucco and a Keene's cement stucco. The company has been licensed by the United Insulation Co., Chicago, Ill., to process insulating plasters and slabs, with a portland cement or gypsum binder and vermiculite, for sale throughout the state of Kansas. The weight of the plasters is 9 lb. to the cubic foot, with a 1:1 ratio of binder to vermiculite, they contain a very low percentage of water, and the coefficient of thermal conductivity is .33 B.t.u.

New Plant to Manufacture Concrete Pipe

Caldwell Concrete and Pipe Co. has located a new plant at Nampa, Idaho, to manufacture about five miles of concrete tile to be used on Nampa's irrigation ditches. The plant is to remain in operation at Nampa when the project is completed.

Charles Miller Concrete Manufacturing Co., Chattanooga, Tenn., has completed a new building, of concrete and steel construction at a cost of $10,000. The concern manufactures concrete pipe, fence posts and other products in concrete.

Black Hills Clay Products Co., Belle Fourche, S. D., has purchased the cement brick business of the Dark Canyon Stone Co., Rapid City, S. D., and intends to increase the manufacture and sale of concrete brick and other concrete products.

• Reported •

By Geo. D. Roalfe

Los Angeles

WEST COAST ACTIVITIES

FIRE TEST OF PUMITILE

AN INTERESTING FIRE TEST was made on October 13, 1937 at Fresno, Calif., on a panel constructed from Pumitile hollow concrete units. The plant and operations of Jourdan Concrete Pipe Co., manufacturers of Pumitile were described in the August, 1937 issue of ROCK PRODUCTS. Its president Mr. H. W. Chutter conducted the test in collaboration with The Twining Laboratories of that city.

Representatives of the Department of Public Works of Fresno, The Federal Housing Administration, the State Veterans Welfare Board, The Board of Fire Underwriters of the Pacific, the Portland Cement Association and numerous architects, engineers and contractors totaling more than fifty persons were in attendance. Mr. Walter Putnam, superintendent of buildings, Pasadena, was present as an unofficial representative of the Pacific Coast Building Officials Conference.

The specimen consisted of a panel 48¾-in. wide by 73-in. high and was 8-in. thick. It was made up of regular commercial 3⅝- x 8- x 12-in. pumitile hollow blocks with two cored holes. They were laid up in mortar having the proportions of one part of portland cement, one part of lime and five parts of sand. An admixture of 10-lb. of pumicite to each sack of cement was used. Preceding the test, this panel was air cured and dried for six weeks.

How the Fire Test Was Made

In preparation for the fire test, the panel was mounted vertically in a compression machine with asbestos pads at the top and bottom of the specimen. The bottom supporting member was carried by two hydraulic jacks which were used in controlling the compressive stress and total load on the panel. These were measured as total load in tons on a calibrated gauge.

A fire box exactly fitting the face of the panel was constructed with fire brick and pumitile. At the end opposite the test panel an opening was left 2-ft. 6-in. from the bottom through which an oil burner nozzle was inserted. This enabled the application of the flame to the entire face of the panel. Two small openings were left on each side for convenience in measuring the under face temperature of the pumitile panel with a Leeds and Northrup Optical Pyrometer. External temperatures were measured by means of five thermocouples arranged on the outside face of the panel. Two were located 14-in. from the top and 15-in. from the sides, one on the center and 36-in. from the top and the other two, 18-in from the bottom and 15-in. from the sides of the panel. These were numbered from 1 to 5, beginning from the top left-hand corner; No. 3 is the center one, No. 4 is below No. 1 and No. 5 below No. 2, respectively.

Compression Tests

With the exception of the dimensions of the test piece, the procedure specified by the American Society for Testing Materials, Designation C 19-33, was followed. The initial load was 17 tons which increased to 18 tons at the end of 30 minutes, increasing to 19.5 tons in the next five minutes at which point it was maintained during the balance of the test. Observations were taken at five-minute intervals during the first hour and at 15-minute intervals for the last four hours of the five-hour test. The results are given below:

Two small cracks developed on the outside face of the wall after two and one-half hours of heating.

Hose Stream Test

A hose stream test was subsequently made with the same panel. The data on this test are shown below:

Temperature of Wall	1700 F.
Pressure on Wall	19 tons
Water Pressure	35 lb. at Nozzle
Size of Hose	3-in.
Size of Nozzle	1¼-in.
Nozzle distance from face of wall	20-ft.
Time stream applied	2½-min.

No failure or cracks were produced by this test, although some mortar was eroded from the vertical joints slightly below the center of the panel.

A compression to fracture test was made on the same panel 18 hours after the hose test. Starting with an initial load of 19 tons, gradually increasing it to 39 tons at the end of 30 minutes, and then to 50 tons, at the end of 45 minutes reaching the point of failure.

Temperature of Time	Exposed Face	Temperature of Thermocouples on Unexposed Face					
		No. 1	No. 2	No. 3	No. 4	No. 5	Average
0	62° F.	62° F.	62° F.	62° F.	62° F.	62° F.	62° F.
5 Min.	62	62	62	62	62	62	62
10 "	62	62	62	62	62	62	62
15 "	1484	66	66	66	66	66	66
20 "	1530	78	78	70	68	70	73
25 "	1640	88	86	78	74	74	78
30 "	1640	94	100	94	78	80	89
35 "	1740	102	110	100	88	96	99
40 "	1670	108	120	114	94	100	109
45 "	1700	114	146	124	106	142	126
50 "	1758	122	206	136	110	180	150
55 "	1770	126	206	146	118	198	160
1—Hour	1740	138	206	166	126	206	168
15 Min.	1860	144	206	194	186	206	187
30 "	1840	166	206	194	194	206	193
45 "	1900	188	206	196	202	206	197
2—Hours	1900	188	206	196	206	206	198
15 Min.	1910	190	210	200	202	206	202
30 "	1940	190	214	194	200	206	201
45 "	1920	204	214	192	200	204	203
3—Hours	1950	206	214	188	198	204	202
15 Min.	1970	220	220	192	198	204	206
30 "	1990	240	234	192	196	204	213
45 "	2000	260	246	204	200	204	227
4—Hours	1930	280	266	212	198	196	230
15 Min.	2040	306	302	226	206	196	247
30 "	2100	316	316	250	226	196	261
45 "	2050	356	366	286	246	196	290
5—Hours	2070	378	398	330	266	206	317

Develop "Rock Scrubber and De-shaler"

MODERNIZE FOR QUALITY PRODUCTS

How C. C. WETZSTEIN

Solved the Problem of Producing a Clean Specification Product

EVERY PRECAUTION IS TAKEN BY THE LAKE VIEW CONCRETE TILE CO., Lake View, Iowa, to insure the manufacture of quality concrete products, even to the production of its own washed sand and gravel aggregates. Since the company began operations at Lake View in 1913, a sand and gravel plant has been operated to produce aggregates for making concrete products. Some of the aggregates are sold commercially.

Since 1913, experience has resulted in the development of a plant capable of producing a clean specification product which surpasses that of many commercial plants. A modernization program has been in progress for the past four years.

Develop Equipment to Remove Clay and Shale

During the past year the aggregate plant has been remodeled and equipped with a "rock scrubber and de-shaler" of unusual design developed by C. C. Wetzstein, president and general manager, who has been experimenting for years in an effort to produce a 100 percent clean gravel.

The plant is a slackline operation in a deposit running about 50 percent gravel and with an abundance of sand and 15 percent clay. In excavating to depths of 30 ft. or more below water, the ¾-cu. yd. Link-Belt bucket often contains much clay.

Only about five hours a week are required to size and wash about 200 tons of sand and gravel—the normal requirement for the manufacture of concrete products. The excavated mixture of sand, gravel and clay is delivered to the top of the plant and passed through a home-made 5-ft. by 30-in. rotary scalping screen with 2¾-in. round openings.

Oversize is not crushed, but is chuted to a refuse hopper. Material passing through the scalper is chuted to a 6- x 8-in. Universal jaw crusher mounted on the low roof of the concrete products plant near the point where the excavating bucket emerges from the water. Use of an additional bucket elevator is eliminated by chuting the crusher discharge into the path of the scraper bucket, where subsequent delivery of material to the plant will include the crushed gravel.

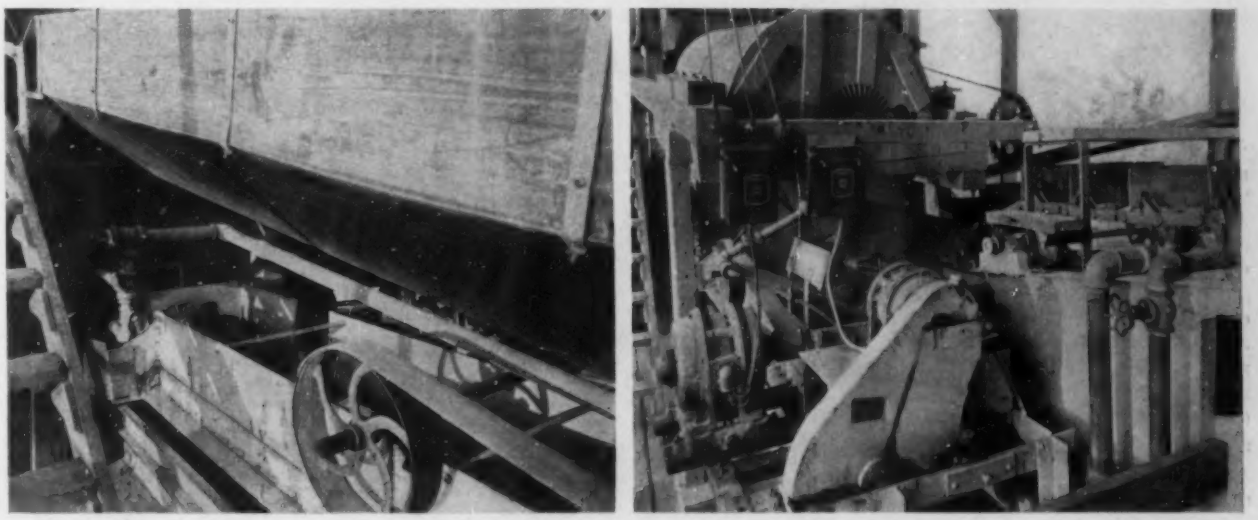
Minus 2¾-in. material from the scalper is passed through a second 6-ft. by 30-in. revolving screen (⅞-in. sq. openings) followed by a 40-in. by 7-ft. revolving sand screen with ¼-in. square openings. The "sand" flows to a 30-in. home-made flight-type sand drag, where the overflow water and clay is flumed back to low land, and the sand is dewatered and placed in bin storage below.

Either or both gravel sizes can go to the new "rock scrubber and de-shaler," in which event it is resized after scrubbing. The machine is the outcome of years of experimentation by Mr. Wetzstein to whom a patent has been issued, covering the method of discharging the gravel from the machine. The scrubber will likely be placed on the market in the near future in various sizes and capacities.

Wash water is applied to the screens and the "rock scrubber and de-shaler" by a 5-in. Gould pump, having a capacity of 900 g.p.m.

How the Scrubber And De-shaler Operates

The particular scrubber and de-shaler in operation consists of a box 10-ft. in



Left: "Rock scrubber and de-shaler" designed and built by C. C. Wetzstein, president of Lake View Concrete Tile Co. Right: Revolving screen above "rock scrubber and de-shaler" with sand drag to the right

Left: Batching car, with compartments for aggregates and cement, discharges directly into the mixer. Right: Sand and gravel bins are an integral part of concrete products plant. Batching car passes through tunnel to the mixer serving the large pipe machine

length and 24-in. across the top, with a semi-circular bottom, and a series of manganese steel paddles each about 10-in. long, rigidly fastened to a shaft extending through the exact longitudinal center of the box. One end of each paddle is straight, to churn and smash up particles of clay while the other end is sloped, as seen in the detail drawing, to give a forward movement to the gravel or stone.

In operation, the machine is mounted horizontally, with the gravel from the screens entering at one end. The paddles churn and grind while continually pushing the material toward the other end of the box. The paddles, revolving at 45 r.p.m., extend to within 2 in. of the bottom of the box, which is filled with water to the level of the side water discharge when in operation.

The gravel discharge is through an opening on the opposite side of the box near the end and above the water level. As the gravel approaches the outlet it is lifted, not pushed, out of the water and through the outlet where it is sprayed by water under pressure of about 50 p.s.i. from a 1½-in. water pipe, the spray of water being counter-current to the movement of gravel and entering the box as hydraulic water. The "lifters" were so designed that the dirty water which might accompany the discharging gravel will be removed just as it is chuted to bins, and Mr. Wetzstein says the gravel is 100 percent clean. This particular unit is producing about 25 tons of gravel per hour in a plant where capacity is not particularly required. The gravel either goes direct to bins or over a stationary screen where a size separation is made into two bins.

Plant bins, for two sizes of gravel and one of sand, make up an integral part of the concrete products plant, separating the plant into one room where large concrete pipe are manufactured and a second room for the manufacture of small pipe and other concrete products.

Principal products manufactured are: plain concrete tongue and groove culvert pipe (15- to 24-in. in 4 ft. lengths), reinforced tongue and groove culvert pipe up to 60-in. diameter and 6-ft. in length; 5- to 48-in. concrete drain tile and concrete well curbing.

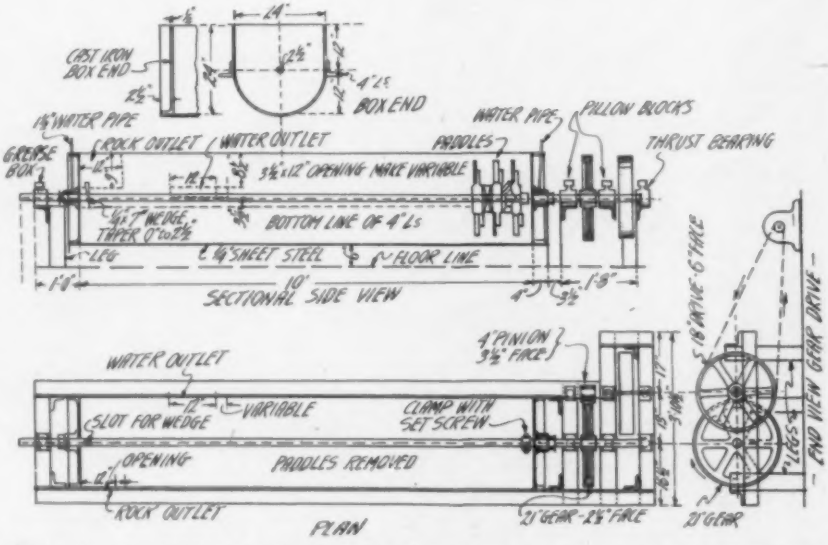
Other products are 8x8x16-in. plain face blocks, 8x8x8-in. plain face, half-blocks, 8x8x16-in. plain face single corner blocks, 8x8x16-in. plain face double corner blocks, 4x8x8-in. plain face quarter blocks; rock face concrete blocks; circular cistern and tank foundation blocks; concrete fence posts; baffled septic tanks; chimney tops and concrete covers for well or septic tanks.

Pipe Manufacturing Facilities

A small batch car, operated in the plant by hoist over 30-in. gauge track, is partitioned for cement and aggregates, and discharges into the Blystone 9-cu. ft. mixer for the manufacture of small pipe and miscellaneous products. Cement in sacks is stored in this room, aggregates being drawn directly from the bin gates.

A tunnel beneath the bins allows cement to be transferred into the second room where a similar 14-cu. ft. mixer serves the large pipe machines. Aggregates are drawn directly from the bins in this room from the bin gates.

Large pipe are manufactured on two Quinn heavy duty tamping machines. The newer of the machines, on which the large pipe up to 60-in. diameter and



Plan and sectional side and end views of "rock scrubber and de-shaler." Note construction of paddles, one end being straight to give a churning action and the other sloped to give a forward movement to the gravel

6-ft. in length are made, has a daily capacity of 75 tons of pipe. This machine was installed two years ago.

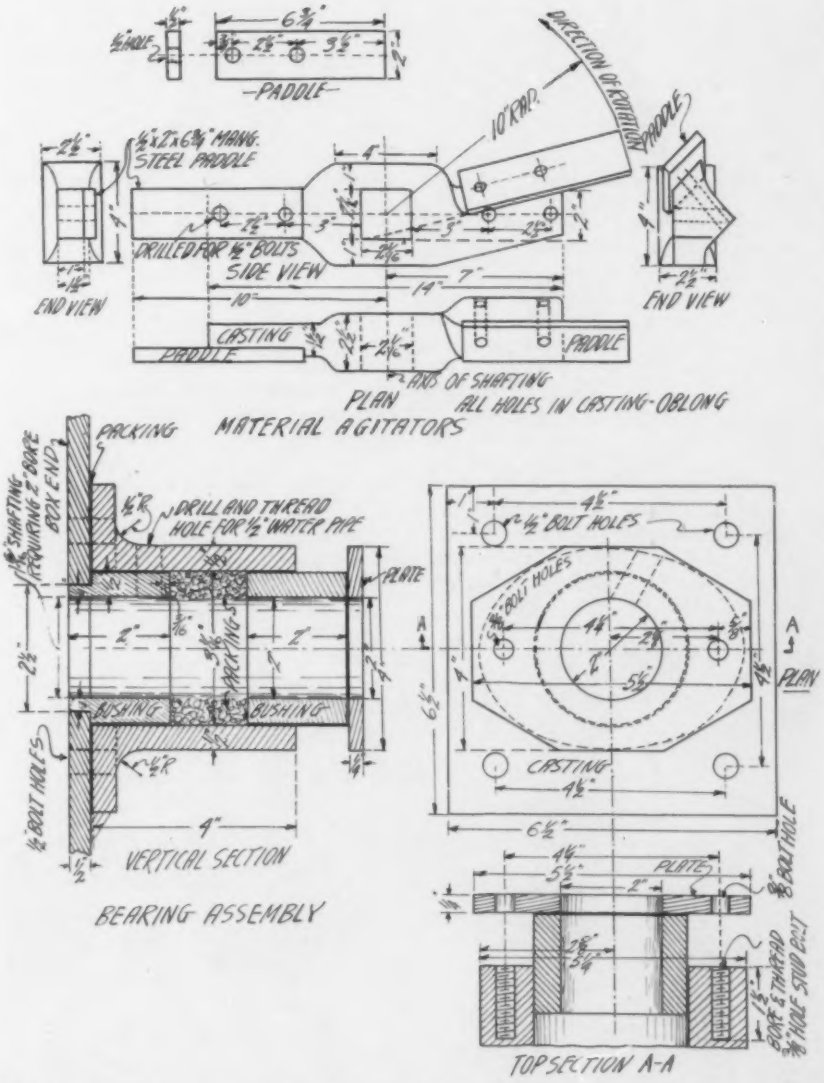
In addition to these tamp machines, smaller pipes are manufactured on two Quinn rotary machines. Blocks are manufactured on an Anchor block machine. All products are steam cured in the winter months. Shipments cover a radius of 80 miles by truck and rail. John A. Wetzstein, Storm Lake, Iowa, is vice-president of the company and Lora Wetzstein, Lake View, is secretary and treasurer.

CITIES FUEL & SUPPLY CO., Milwaukee, Wis., is now installing a steam curing plant and other equipment to manufacture various concrete products, including Waylite blocks.

Start Manufacture of Concrete Silos and Block

NEW LONDON CONCRETE PRODUCTS CO., New London, Minn., went into production a few months ago making concrete silo staves, and has since added concrete building block and culverts. All products are steam cured. Lawrence Christopherson is plant foreman, and C. F. Olson is in charge of sales.

SOUTHEASTERN SAND AND GRAVEL CO., Union Springs, Ala., has removed its offices to the Bank of Tallassee building, Tallassee, Ala. Stockholders recently met and elected Roberts Blount, president, to succeed Winton M. Blount. E. J. Pierce is vice-president and R. E. Ellzey, general manager in charge of operations.



Above: Paddle construction details. Below: Bearing assembly, vertical section view to the left and top section to the right

Glass in Clinker

NATIONAL BUREAU OF STANDARDS, Washington, D. C., has made available Research Paper R. P. 997, "Method for Approximating the Glass Content of Portland Cement Clinker," by William Lerch and Lorrin T. Brownmiller, research associates, Portland Cement Association. The method described involves a determination of the heat of solution of the original clinker and of the same clinker which has subsequently been annealed under conditions designed to produce complete crystallization. The difference between the heat values so obtained is due principally to the latent heat of crystallization of the glass present in the original clinker. The ratio between that value and the latent heat of crystallization of the glass phase represents the glass content of the clinker. A curve is given showing the latent heat of crystallization of all possible glass compositions obtainable from melts at 1,400 deg. C. in the system $CaO—Al_2O_3—SiO_2—Fe_2O_3$ between the Al_2O_3/Fe_2O_3 ratios of 0.64 and 3.24.

Visualizing Heat

JOHNS-MANVILLE CORP., New York, N. Y., has produced and is now showing a sound motion picture entitled, "Heat and Its Control," which very interestingly depicts the progress made in the effective conservation of heat. The importance of this contribution to industry lies in the fact that this talkie makes available for the first time an actual visualization of what heat is, and the story of its use and methods of conservation. "Heat and Its Control," filmed by Caravel Films, Inc., visualizes the story of heat from the time man worshipped the sun, to present day methods of development and manufacture of heat conservation materials. The first official showing of "Heat and Its Control" was attended by 150 representatives of the industrial and technical press at New York City. At the same time, Johns-Manville announced publication of an authoritative handbook "Heat" which supplements the movie, covering approximately the same ground in greater detail.

Fuller's Earth May Be Developed in Louisiana

FINAL EXPERIMENTAL TESTS on drillings for fuller's earth have revealed a 70-ft. vein of rich material near Bogalusa, La., according to reports and it is said that "wildcat operators" are already making their appearance. Bogalusa has promise of becoming headquarters for an active development in mining fuller's earth.

E. H. Wetzel standing next to a storage pile of zinc slag used as aggregate in making light-weight concrete products

Light Weight Products Made With

ZINC SLAG AGGREGATE

Attract New Markets

An Interview With

E. H. WETZEL

Gen. Mgr., Wetzel Cast Stone Co.

ALTHOUGH THE FIRM HAS BEEN IN PRODUCTION for only a few months, the Wetzel Cast Stone Co., Springfield, Mo., has steadily increased its volume of building trim stone business, and is cultivating a substantial market for concrete products, several of which are being introduced in Springfield for the first time. The main product of the company, however, is cast stone manufactured for trim and sold over a wide radius on government, municipal and school building projects. Since the plant went into production in April, shipments of trim stone have been made on projects as far as Little Rock, Ark., and ultimately will reach into more distant markets.

E. H. Wetzel, general manager of the company, has been a manufacturer of cast stone in Kansas City, Mo., for 15 years, and before coming to Springfield was established at Carthage, Mo., for nine years. All cast stone products are manufactured according to the design of the architects, many of whom had co-operated with Mr. Wetzel in his previous connections.

Capacity of the cast stone plant is 15 to 20 tons of trim stone per day. Tombstones, faced with granite or marble aggregate concrete, have been another good seller.

How Concrete Joists Are Made

The market for other products in concrete has not been overlooked, and already a number of them are being manufactured as a profitable sideline. Standard 8- x 8- x 16-in. concrete building units are manufactured on a Miles hand-operated face down machine, using crushed stone as aggregate. So far, most of these units are being sold for house foundations, and some are used for above ground construction with a stucco finish. The daily capacity of the plant is 200 standard units. Using an attachment, man-hole blocks are also made on the machine.

A number of small and medium size homes are under construction in and around Springfield, opening up a ready market for precast reinforced concrete joists. These units are manufactured in gang molds on a home-made vibrating table, mounted on coil springs and actuated by an off-center shaft, of the type recommended by the Portland Cement Association. About 80 lineal feet of joists can be cast in a single set of molds on this machine.

Another product manufactured is a precast reinforced roof slab made in sizes up to 7 ft. in length. High early strength cement is used exclusively in the manufacture of slabs and joists, and in practically all other products. Slab and joist forms are stripped the day after pouring. All units are water-cured in the plant before being placed in outside storage. Cast stone products are ready for shipment 10 days after they are cast.

Zinc Slag Aggregate For Light Weight Concrete

This concern is quite fortunate in having a readily available source of lightweight aggregate so important in keeping shipping costs down and in the promotion of units for above ground construction. There is no source from which cinders may be obtained locally that will insure a uniform high-grade lightweight concrete unit, and the nearest available lightweight aggregate is several hundred miles distant, making shipping costs prohibitive in an undeveloped market. The manufacture of concrete roof slabs for shipment to distant points is dependent upon the supply of lightweight aggregate.

In the background is the plant of the Wetzel Cast Stone Co., and in front is the storage yard for cast stone products

Interior of cast stone plant. To the left may be seen a pile of concrete joists, and to the right is the equipment for making special forms

This problem was solved by the discovery of a practically unlimited supply of zinc slag, remnants of an old zinc mine near Joplin, Mo. It is probably the only plant making lightweight precast units from zinc slag. Perhaps a million tons of slag are available to depths ranging from 10 to 50 ft. in thickness on the leased property.

In the process of extracting the zinc from the flint rock in which it occurs, the rock is heated to about 2700 deg. F., and suddenly quenched by cold water, leaving a slag highly cellular in structure and containing all the physical properties of such material valued for insulation purposes. In fact, the zinc-extracting process practically duplicated the methods of "blowing up" some of the commercial lightweight concrete aggregates.

A cubic foot of concrete made from this zinc slag weighs 90 to 100 lb., and is easily nailed. The waste zinc slag is generally small in size and contains an abundance of fines. None of it is crushed, but the company sizes the slag over a flat screen before delivering to the plant in Springfield. Slag passing the ¾-in. square openings is hauled in eight or 10-ton trucks to the plant. Using a standard mix, with zinc slag as aggregate, compressive strengths average 2400 to 2500 p.s.i.

The aggregate is used exclusively in the manufacture of roof slabs, and for backing in the larger pieces of trim stone which are to be shipped any great distance. This light weight aggregate undoubtedly will help pave the way for the sale of other products to be used in construction above ground.

New Firm Produces Stabilized Road Material

ROADCRETE, INC., a new concern, has constructed a modern plant on property of the Ohio Gravel Co., at Newtown, Ohio, and is producing stabilized plant-mixed road material known as "Roadcrete." Sand, gravel, soil and calcium chloride are mixed in a pugmill, water is added, and the mixture is discharged to a pit and loaded into trucks by a crane. The plant was formally opened in October and viewed by over 100 engineers and contractors.

NU-CARTH BRICK AND STONE CO., Carthage, Mo., is completing a new concrete products plant on a site leased from the Independent Gravel Co., Joplin, Mo. The main plant is 40 by 50 ft. in plan. A steam curing room is under construction. Products to be manufactured are concrete block, Dunbrik and "Carthwall," a precast slab perfected by A. L. McCawley of Carthage. Owners are Luke J. Boggess and A. J. Graul.

Concrete Pavement Yardage

AWARDS of concrete pavement for October, 1937, have been announced by the Portland Cement Association as follows:

Type of Construction	Sq. Yd. Awarded during Oct. 1937	Total sq. yd. for year to date Oct. 30, 1937
Roads	2,403,377	35,047,113
Streets	852,438	11,469,815
Alleys	39,293	468,998
Total	3,295,108	46,985,926

P. C. A. Broadcast

(*Continued from page 49*)

only just learned to use those four best weapons in accident prevention—engineering, education, enforcement and enthusiasm. Enforcement of safety rules growing out of engineering and education has been an important part of the job. Our men have followed enthusiastically. Though proud of the distance we have come we cannot be complacent about the present or too optimistic about the future. We have yet a big job to accomplish and we can only succeed in the next quarter of a century by keeping everlastingly at it."

The broadcast was closed with a benediction by Dr. Norman Vincent Peale, pastor of the Marble Collegiate Church, New York City, and the singing of a verse of one of the famous Thankgiving hymns by the NBC quartette. Individual plant programs then followed, special honors being accorded the 25-year men in many of the mills.

The Latest in Methods, Materials and Equipment Awaits You—at the

CONCRETE INDUSTRIES EXPOSITION

SPONSORED BY

NATIONAL CONCRETE MASONRY ASSOCIATION

AMERICAN CONCRETE CONTRACTORS ASSOCIATION

Come to the . . . Four Big Events

1. The National Concrete Masonry Association Convention
2. The American Concrete Contractors Assoc. Convention
3. Cast Stone Institute Convention
4. Concrete Industries Exposition

February 8, 9, 10, 11, 1938

at the

SHERMAN HOTEL

Chicago, Illinois

Here you will see the greatest display of concrete machinery, equipment and materials ever assembled. Every well known product of the concrete industry will be on display.

Don't miss this golden educational opportunity to meet with the nationally known leaders of the industry. Come and learn about new, improved methods that will give you new ideas that you can apply to your own business in 1938.

▼ ▼ ▼

Plan NOW to attend these conventions to take place simultaneously with the

Concrete Industries Exposition

News About People

Walter Dyckerhoff, an authority on cement manufacture from Mainz, Germany, is now making a tour of the United States, during which he will study modern cement production methods in the United States. Mr. Dyckerhoff represents the fourth generation of his family to head the huge cement business bearing his name.

R. J. Reigeluth, treasurer of the New Haven Trap Rock Co., and an official of C. W. Blakeslee & Sons, New Haven, Conn., has been appointed vice-chairman for heavy construction, Construction Section Executive Committee, National Safety Council. H. G. Campbell, of Harry T. Campbell Sons Co., Towson, Md., crushed stone and calcite producer, was made vice-chairman for highway construction.

Commander Ben Moreell of the U. S. Navy civil engineer corps, who is prominent in the American Society for Testing Materials and the American Concrete Institute, has been appointed chief of the Bureau of Docks and Yards with the rank of Rear Admiral. Commander Moreell is a well known figure in the industrial minerals field through his addresses before conventions. He is now stationed at Pearl Harbor, Hawaii, as public works officer of the 14th naval district.

Phil Bushnell is the new manager of the Safety and Personnel Department, Missouri Portland Cement Co., St. Louis, Mo. Prior to his new connection, Mr. Bushnell was safety engineer with the Portland Cement Association, and a popular figure in the industry.

Donald E. Koch, recently appointed chief chemist of the Giant Portland Cement Co., Egypt, Penn., is one of the youngest chief chemists in the industry. He is 31 years old. Mr. Koch succeeds Mr. S. G. McAnally, whose appointment as general superintendent of the Brazilian Portland Cement Co., Sao Paulo, Brazil, was mentioned in the October issue of Rock Products.

Although young in years, Mr. Koch has been identified with the manufacture of cement since September, 1923 when he started as sample boy with the Sandusky Cement Co., (now Medusa Portland Cement Co.) at the York, Penn., plant. Since that time, however, Mr. Koch has made rapid advancement, largely because he studied at night school in preparation for greater responsibilities. Immediately

Donald E. Koch, recently appointed chief chemist of Giant Portland Cement Co., holding his daughter

after he received his first job he matriculated at the YMCA college in York, Penn., for a three-year course in drafting, shop engineering, and chemistry which was conducted under the auspices of Pennsylvania State College.

By 1929, when Mr. Koch had become assistant chief chemist at the newly acquired plant of the Medusa Portland Cement Co., at Wampum, Penn., (formerly Crescent Portland Cement Co.) he had successively risen in responsibility and position from sample boy to physical tester, mix-control chemist, and chemical analyst. While at Wampum, Mr. Koch improved upon his education by taking night school courses at Geneva College, Beaver Falls, Penn.

He remained at the Medusa plant in Wampum, Penn., until January, 1932, when he was appointed assistant chief chemist at the Standard Portland Cement Company's plant in Painesville, Ohio, a position which he continued to hold until his recent appointment with the Giant Portland Cement Co. Mr. Koch is married, and has a daughter 17 months old.

E. N. Gustafson has been appointed assistant district engineer of the Portland Cement Association with headquarters in Austin, Tex., assisting C. A. Clark, district engineer. Mr. Gustafson, who has been active in civil engineering work for the past 25 years in the Texas Gulf Coast territory, attended Southwestern University and the University of Texas. For a number of years he was engaged in irrigation, conservation, and flood control work, and at one time was city engineer of Bay City and Palacios. He was also chief engineer on the largest privately-owned irrigation system in Texas, and prepared the survey and report for the Brazos River rice irrigation project now under way. For two years, Mr. Gustafson was chairman of the Governor's State Engineers' Committee on the Colorado River watershed. He has also been in charge of numerous highway construction projects as resident engineer and division engineer for the State Highway Department. Since 1935, he has been on the engineering staff of the Portland Cement Association in Texas.

William Powell has again resumed his activities as safety director for Medusa Portland Cement Co., Cleveland, Ohio. Mr. Powell had been devoting considerable time to field work for the company, and his long experience in conducting safety campaigns makes him well-equipped to supervise safety work.

Raymond M. Beaton, formerly district manager in New York for the Universal Atlas Cement Co., has been appointed sales manager of the Glens Falls Portland Cement Co., assuming his new duties on November 1.

W. O. Mauldin, field representative of Universal Portland Cement Co., Hudson, N. Y., recently gave an illustrated talk on the manufacture of cement at a meeting of the Dutchess County Chapter of the New York State Society of Professional Engineers at Poughkeepsie, N. Y. Several reels of motion pictures depicted the manufacture of cement, beginning with the quarrying of limestone

Jack Dempster, a well-known writer on the subject of Safety, has been appointed safety director of the entire Canada Cement Co., Montreal, Que. Mr. Dempster has been active in safety work with his company for a number of years.

The illustrations of the three new safety directors are printed through the courtesy of Accident Prevention Magazine, P. C. A. Chicago, Ill.

to the sacking of the finished product. The meeting was in charge of Kurt G. Rauer, of the Division of Highways, State Department of Public Works, and president of the Dutchess chapter.

ROBERT BLOUNT was recently elected president of the Southeastern Sand and Gravel Co., Union Springs, Ala., succeeding Winston M. Blount. The stockholders elected E. J. Pierce as vice-president and R. E. Elizey as general manager in charge of operations.

ANDERSON DANA, chairman of the Seaboard Sand and Gravel Corp., heads the new sand and gravel section of the New York Board of Trade. Associated with him on the committee are Frank B. Clancy, treasurer, Henry Steers, Inc.; Frank H. Morse, Cranford Material Corp.; Joseph J. Ryan, N. Ryan Co.; Joseph DiFiore, Locust Builders' Supply Co.; E. D. Boylston, Metropolitan Sand and Gravel Corp.; John J. Bosch, McCormack Sand and Gravel Corp. Dr. Charles A. Drake, industrial consultant, is in charge of the section's activities. At present a drive is being made against so-called bootlegging of sand and gravel which has resulted in unfair cutting of prices.

F. R. MCMILLAN, a member of the mass concrete committee, American Concrete Institute, and at present director of research, Portland Cement Association, recently paid a visit to Yakima, Wash., with O. G. Patch, concrete engineer on Coulee Dam, to observe the results of their work in connection with the construction of Sunnyside canal built in 1907 and 1908.

STANFORD T. CRAPO, vice president and treasurer of Huron Portland Cement Co., Detroit, Mich., was re-elected a class "B" director of the 7th Federal Reserve Bank district for a period of three years, beginning January 1, 1938.

HAROLD B. ROBESON has been made executive vice president and general manager of the Nazareth Cement Co., Nazareth, Penn., according to a recent announcement of several changes in official personnel, following the death of Geo. F. Coffin, secretary-treasurer and general manager. Mr. Robeson formerly had the title of vice president and sales manager. Howard M. Whiting is the new secretary and treasurer; C. F. Michael is assistant secretary, and S. J. Fehnel is assistant treasurer.

FRANK D. COPPOCK, president of the American Aggregates Corp., Greenville, Ohio recently left on a four weeks' tour to the Northwest where he will visit the site of the Grand Coulee Dam. He will assist engineers of the Walsh Construction Co., in an advisory capacity, concerning economical methods of handling sand and gravel and will help in drafting plans for a gravel plant. Mrs. Coppock will accompany her husband.

H. H. LAUER, for the past two years head administrative officer of the cement plant project of the Puerto Rico Reconstruction Administration, San Juan, Puerto Rico, is returning to New York, December 7th to enter consulting engineering work on cement and industrial plants.

Industry's Friend Honored

FRANK O. WYSE, advertising manager of the Bucyrus-Erie Co., South Milwaukee, Wis., is well-known in the crushed stone and sand and gravel industries because of his energetic work in helping to make the machinery exhibits at the annual conventions of the National Associations successful. These friends will be glad to know that Mr. Wyse has reached the highest distinction in his special field—he was recently elected president of the National Association of Industrial Advertisers.

Frank O. Wyse

In recognition of his achievements in the industrial advertising field and his election to the presidency of his association, a complimentary dinner was tendered Mr. Wyse at the Milwaukee Athletic Club on November 18, which was attended by many company executives and practically all the industrial advertising fraternity of Milwaukee and nearby cities. Col. Willard Chevalier, vice-president of the McGraw-Hill Publishing Co, New York City, was the principal speaker of the evening.

W. M. MILLER, associated with the Southern States Portland Cement Co., was elected treasurer of the Rockmart Civic Club, Rochmart, Ga.

HOWELL J. DAVIS, vice president of the Volunteer Portland Cement Co., was elected vice president of the Tennessee Manufacturers Association at a recent meeting in Nashville.

J. R. NEWBERRY is the new production manager of the United States Gypsum Co., Chicago. He was formerly works manager of the Greenville, Miss. plant, having been succeeded by P. E. Roberts, whose appointment was mentioned in the November issue of ROCK PRODUCTS. O. W. Frost, who had been acting works manager at Greenville, has assumed the duties of general mill superintendent.

GORDON TONGUE, treasurer and sales manager of the Superior Portland Cement Co., Inc., Seattle, Wash., recently gave an address before the Toppenish, Wash., business men in which he declared that the Pacific Northwest, with its millions of acres of fertile land reclaimed through irrigation would be the "new frontier" of America. He pointed out that we are still two million homes behind the normal building average.

D. A. CHEYETTE, formerly Chicago district manager of the Traylor Engineering and Manufacturing Co. is now with the sales department for crushers and screens of the Nordberg Manufacturing Co., Milwaukee. Mr. Cheyette has a large circle of friends and acquaintances in the rock products industry.

J. A. WHYTE is the new general superintendent of Gifford-Hill & Co., Inc., Dallas, Tex., large sand and gravel producers, and will have his headquarters at Texarkana, Tex.

How To Increase Use Of

AGRICULTURAL LIMESTONE

By NATHAN C. ROCKWOOD

AN EARNEST GROUP of agricultural limestone producers from the states of Indiana, Illinois and Missouri met at the French Lick Springs hotel, French Lick, Ind., on November 12 and 13, to consider ways and means of aiding the federal government's program for soil conservation. The occasion was the annual meeting of the Midwest Agricultural Limestone Institute. E. J. Krause, Columbia Quarry Co., St. Louis, Mo., president of the Institute, presided.

Promotion

The subject uppermost in the minds of all was promotion of their product at a cost commensurate with its low price in Illinois (around $1.00 per ton, f.o.b. plant). The main purpose of the Institute is coöperative promotion, which is not easy in highly competitive, overlapping territories. In Illinois the situation is somewhat complicated by the fact that the Illinois Agricultural Association and the County Farm Bureau organizations are important factors in the distribution of agricultural limestone.

It has been the custom to grant a special discount to farmers who were members of, or placed their orders through, the county farm bureaus. (The members of the farm bureaus are automatically members of the Illinois Agricultural Association.) It developed from the discussion that this is not feasible, or very likely it is now illegal, unless the farm bureau actually fulfills the functions of a dealer. When the farm bureau does this, it was decided that the farm bureau was entitled to the discount, which it might pass on to its members (the farmer purchasers) as would any co-operative purchasing organization.

J. L. Fay, newly elected vice president

E. J. Krause, re-elected president of the Midwest Agricultural Limestone Institute

Various specific methods of promotion were discussed. Dan Sanborn, secretary of the Institute, reported on the exhibit at the Illinois state fair at Springfield, in August. The results were not satisfactory to the majority of producers because the attendance at the fair is confined chiefly to farmers from immediately adjoining counties; therefore, it was voted not to have an Institute exhibit at the 1938 fair, although individual producers announced intention to have their own exhibits.

Co-operation with reliable motor truck owners was considered about the surest way of developing more business. The truckers deliver from both plant and distributing points established by the producer. Many truckers put the limestone on the fields by use of a limestone spreader attached to the rear of the truck. E. P. Kastien, president of the Peoria Steel and Wire Co., Peoria, Ill., was present to exhibit such a spreader, mounted on pneumatic tires, which his company manufactures.

Co-operation with the farm bureaus, the state college of agriculture and the federal soil conservation organization of course are important. It was suggested that bankers could also be helpful by insistence on proper soil conservation when they made loans to farmers. J. R. Bent, Dolese & Shepard Co., Chicago, former manager of the limestone and phosphate department of the Illinois Agricultural Association, suggested that legislation might be passed exempting from taxation, farm lands withdrawn from production for soil building.

Prof. C. M. Linsley, University of Illinois, Urbana, was present as a guest and contributed several valuable sugges-

J. R. Bent, the new secretary of the Institute

tions: He said the present annual consumption of agricultural limestone in the state is about 1,000,000 tons, while for bare maintenance of the soil in its present condition of fertility requires 4 or 5 million tons. Something like 50 million tons is needed immediately. Some counties have already reached a practically barren state through want of measures to prevent soil erosion.

Prof. Linsley spoke as an agricultural expert who had almost reached the point where he believed all the educational work that could be done had been done; and what he really did was to appeal to the producers of agricultural limestone as public benefactors to put on an intensive promotional and sales campaign which would result in getting farmers to buy. He said the use of limestone is the basis of the whole soil conservation program.

Prof. Linsley reviewed the steps taken and contemplated by the Agricultural Adjustment Administration and the Federal Farm Loan Banks to induce the farmers to lime their soils—such as getting the farmers to accept limestone in lieu of money for soil conservation benefits; short-time loans for soil improvement (Iowa already has such legislation). But above all these he placed an intensive sales campaign by producers of agricultural limestone.

The best time of year for a promotional campaign is August, according to Prof. Linsley.

Officers Elected

E. J. Krause was reëlected president; J. R. Bent was elected secretary; J. L. Fay, Moulding-Brownell Co., Chicago, Ill., vice-president; Geo. H. Hart, Newton County Crushed Stone Co., Kentland, Ind., treasurer. In addition to the above, the following were elected directors: Harry A. Clark, Consumers Co., Chicago, Ill.; Daniel Sanborn, Lehigh Stone Co., Kankakee, Ill.; G. H. Rippetoe, Anna Quarries, Inc., Anna, Ill.; Charles F. Meyer, Jr., Midwest Rock Products Corp., Indianapolis, Ind.; E. S. Lockhart, Marblehead Lime Co., Chicago, Ill.

Daniel Sanborn, retiring secretary

Among the members and guests present in addition to the officers and directors and speakers already named were: John R. Spencer, manager of the limestone and phosphate department of the Illinois Agricultural Association; E. H. Bills, Moulding-Brownell Co., Sheffield, Ill.; N. N. Carter, National Stone Co., Joliet, Ill.; D. S. Pickett, Lehigh Stone Co., Kankakee, Ill.; Robt. J. Hummel, National Stone Co., Joliet, Ill.; Norman E. Kelb, Ohio and Indiana Stone Co., Indianapolis, Ind.; E. D. Van Cleave, Ohio and Indiana Stone Co., Greencastle, Ind.; H. M. Hollingsworth, Ohio and Indiana Stone Co., Indianapolis; H. H. Marsh, Lehigh Stone Co., Kankakee, Ill.

New $30,000 Molding Sand Blending Mill Completed

SOUTHERN SAND Co. and the Porter Warner organization are producing blended molding sands in modernly equipped mills from the Ripley formation in the Benton-Carroll counties area in western Tennessee. The latter concern has just completed a mill at a reported cost of $30,000. The bulk of the sand shipments from these mills and from other plants in this area goes to foundry centers in Tennessee, Georgia, Alabama, Texas and some sand is shipped to northern points. The molding sand industry of Tennessee, according to figures just published by the Tennessee Division of Geology, Nashville, Tenn., is producing in excess of 30,000 tons annually.

Fire Destroys Tennessee Bleaching Clay Plant

TENNESSEE BLEACHING CLAY CORP., Paris, Tenn., suffered the loss of its processing mill by fire of undetermined origin on November 15. Damage to equipment and plant was estimated at about $25,000. Three carloads of finished product, awaiting shipment, were also destroyed. Plans are in progress to rebuild the mill at once.

New Tripoli Plant In Tennessee

MCCALL MINING Co., Huntingdon, Tenn., has started making shipments of ground tripoli from its new mill near Parsons in Decatur county, Tennessee. The new plant is the result of several years' investigation of the tripoli deposits of West Tennessee by W. C. McCall who, with George T. McCall, are owners and operators of the new mill. The tripoli, a soft fine-grained white type, occurs in massive deposits of possibly 100 ft. or more in depth. About 1200 acres of tripoli-bearing land, adjacent to present workings, have been leased.

The processing mill consists of a 4½- by 24-ft. rotary drying kiln, rotary screens with ¼-in. mesh openings, a 5- by 12-ft. tube mill, Raymond mechanical air separator, and accessory conveyors. The plant is powered by a 60-hp. Diesel engine. Heat for drying is developed by an oil-burning kiln.

The lump tripoli, as delivered from the mine, is dried in the rotary kiln and then passes to the rotary screen. The oversize is returned to the tube mill for grinding, and the screened (¼-in. minus) material goes to the separator, which removes the 300-mesh product and returns the oversize to the tube mill for further grinding. The tube mill product goes directly to the separator for final classification, to reduce the load of fines in the tube mill. The finished product of the mill can be classified to 99.75 percent through 300-mesh. Capacity of the mill is rated at 1½ tons of ground tripoli per hour.

Employes Co-operate to Open Mexican Cement Plant

THE CEMENT PLANT at Hidalgo, State of Nuevo Leon, Mexico, is to be placed into operation soon, as the result of financial aid given by the Mexican government through the National Bank of Popular Credit. The plant, which had been closed for ten years, is to be operated by a coöperative society of former employes organized for that purpose in January, 1936. The plant has undergone reconditioning since that time. To finance the reorganization and reopening, 400,000 pesos ($111,111) was provided, of which 80,000 pesos was advanced by dealers in cement and the balance by the bank. Of this sum, 136,000 pesos have been spent for new materials, and the remainder will be used to pay operating expenses and minimum salaries until the loan is repaid. The bank named the technical personnel and the cashier of the coöperative society. Capacity of the plant is from 300 to 380 tons of cement daily. With two large dams under construction, it is likely that the plant will be operated profitably.

NATIONAL GYPSUM Co. has taken over a large tract of land in Oakdale, Ala., and has awarded the contract to the General Cable Corp. for construction of a $2,000,000 plant to manufacture fibre insulation board.

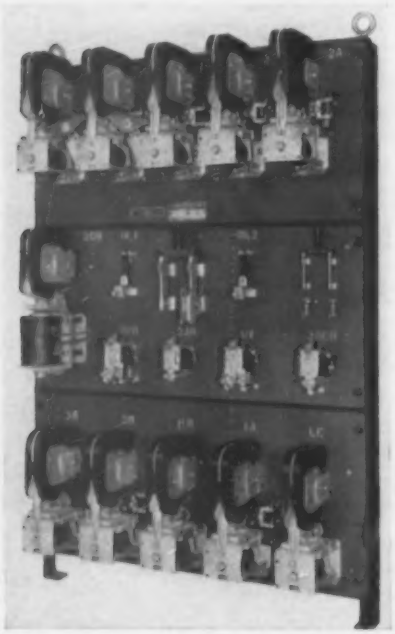
New MACHINERY & EQUIPMENT

Crane-Hoist Control for Rapid and Safe Lowering

General Electric Co., Schenectady, N. Y., has developed a new direct-current crane-hoist control, which makes use of the rocker-bearing contactors and magnetic-time relays that have proven their stamina in steel-mill service. Among the features of the new control are high lowering speeds, excellent speed regulation, precise spotting of the hook, protection of both motor and brake from abuse, and maximum safety for the operating crew.

Power consumption is economical because regenerative braking (which returns power to the line) is obtained for any load requiring 30 percent or greater braking effort. Dynamic braking is also available for emergency stops in case of solenoid brake failure. Automatic control of deceleration by a magnetic-time relay provides safe stopping of loads when lowering. These features make possible high lowering speeds which are limited only by the inherent limitations of the motor.

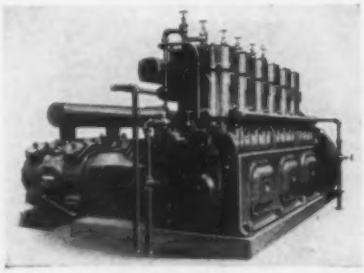
Magnetic-time relays are employed to control acceleration in both hoisting and lowering. Accelerating and decelerating relays are independently adjustable. Accurate handling of all loads is assured by low speeds provided for both lowering and lifting.



Crane hoist control which employs rocker-bearing contactors and magnetic time relays

Gas Engine Compressors Of Four-Cycle, Angle Type

Worthington Pump and Machinery Corp., Harrison, N. J., has brought out a line of four-cycle, angle type compressors to meet the demand for a medium size, self-powered, simple and compact air and gas compressor unit. Combining ruggedness and portability, these Type LCE units occupy little space and, although designed for permanent heavy-duty work, are adaptable for locations which may not be permanent.



Gas compressor unit in which each compressor cylinder has two corresponding power cylinders

They are built with one to four compressor cylinders, corresponding to 75 to 300 hp.; all compressor cylinders are horizontal and at right angles to the power cylinders. Each compressor cylinder has two corresponding power cylinders and the compressor element can be arranged to deliver any combination of volume and pressure within the limits of the engine rating. With this flexibility, it is possible to meet service conditions for any situation.

The compressor cylinders are of the standard Worthington design, and are fitted throughout with light-weight feather valves. Other features of the compressor include large water jackets and close clearances, all of which, it is said, combine to give high volumetric efficiencies.

The engine is a vertical, four-cycle type, with power cylinders, valves and working parts small in comparison with the slower speed horizontal type of similar horsepower. Extremely large water jackets with clean-out plates have been provided.

Of particular importance is the fact that, regardless of engine-compressor size, most parts are interchangeable. This feature eliminates the necessity for carrying a large stock of spares on hand. For example, the engine and compressor connecting rods are identical and interchangeable.

Force-feed lubrication is used throughout, and a deep oil sump is provided in the base of the engine. A separate force lubricator is provided for the power and compressor cylinders. All running gear is totally enclosed, making the unit entirely dirt-proof and dust-proof.

New Quarry Haulage Unit

The Hug Co. has announced the addition of the Model 99S to its present line of quarry trucks. It is built along the same lines as the Model 99, which has given very satisfactory service as a quarry haulage unit.

Either gas or Diesel power may be used with the Model 99S, it has a maximum payload capacity of 40,000 to 44,000 lb., and is designed to handle power hoist bodies up to 12 cu. yd. capacities. The standard engine is the Buda GF-638 gas engine with the Cummins HB-6 Diesel offered as optional equipment. Transmissions include a 4-speed unit and 3-speed auxiliary, giving a total of 12 speeds forward and three speeds reverse.

Truck for quarry haulage designed to handle power hoist bodies up to 12 cu. yd. capacities

The rear axle is the double reduction dual-drive type, equipped with equilizing beams and torque rods to properly distribute the load over both axles and keep them in the same parallel plane. Tires are 12.75 x 20, single front and dual rear, and air brakes on all wheels are standard equipment. Standard equipment also includes an all welded steel cab, and the unit is offered with various types of side and rear dumping bodies and hoists.

Dragline for Long Range Low Ground Pressure Work

THE HARNISCHFEGER CORP., Milwaukee, Wis., presents the P&H Model 955-LC dragline. It is a modern 2½-cu. yd. machine to give bigger production on all

Dragline has aluminum boom to reduce weight

classes of dragline work. Following the type of all-welded design used in other excavators made by this company, the 955-LC has been stripped of tons of dead weight—making it lighter, faster and easier to move. With an 80 to 100-ft. aluminum boom it has a wider working range.

As the best dragline operation requires maximum stability with lowest possible ground pressures, the new model has been provided with exceptionally long crawlers, accommodating shoes 30, 36 or 42-in. in width. Crawlers are of non-clogging type, have a true rolling action in travel, and driving wear is taken on hardened steel link pins rather than shoes, with each pin capable of taking the entire driving load.

Further speeding up production, a new type fair-lead that keeps the bucket moving faster, is incorporated in the design. Large diameter sheaves are light in weight, roll free and easy. Chilled, curved check plates and easy swiveling action keep the cable properly spooled on the drum and pulling in direct line.

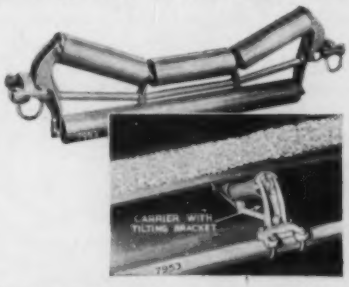
The all-welded, circular lower carbody, reinforced by powerful X-frame construction, provides a strong, rigid design which combined with a new, simplified steering mechanism, makes the 955-LC easier to maneuver.

Hoist and digging drums are mounted tandem fashion to assure true direct line loads from fair-lead to drum. There is ample space on both sides of machinery for the operator. Both hoist and dragline drums are mounted on roller bearings to eliminate chattering or grabbing clutches. Swing clutches also ride on roller bearings to enable them to stand up under the terrific punishment of moving heavy loads at high speed. This advanced practice is said to make possible a faster swing, smoother starting and stopping, quieter clutch action and freedom from costly bushing replacements.

This new model is powered by a 185 h.p., 8-cylinder Diesel engine providing ample power for big production dragline work. Other features include helical gear drive throughout, roller bearing mounted drums, clutches and shafts, a large live roller circle that supports the revolving upper and is tied to the lower car-body by the use of hook rollers to insure balance on long boom operations.

Belt Conveyor Carrier For Pipe Frame Mounting

STEPHENS-ADAMSON MFG. CO., Aurora, Ill., is now marketing a new lightweight ball bearing belt conveyor carrier with several features of interest. The lightweight, rigid, truss-type frame is supported on two parallel pipes instead of structural steel or timber stringers. Carrier brackets are clamped to the pipes without boring holes, and carriers can be shifted whenever necessary. These special end brackets permit the carriers to be mounted on the light, rigid and inexpensive frame made up of standard 2-in. pipes. An ingenious rocker type of mounting permits the carrier to tilt in either direction with the travel of the belt. It is of three-roll design, in which the outer rolls are inclined 20 deg. to trough belt for maximum capacity and greatest belt life. In this way, even a reversible direction



Easily movable belt conveyor carrier originally designed for underground service

belt is centered on the carriers without the use of guide rollers.

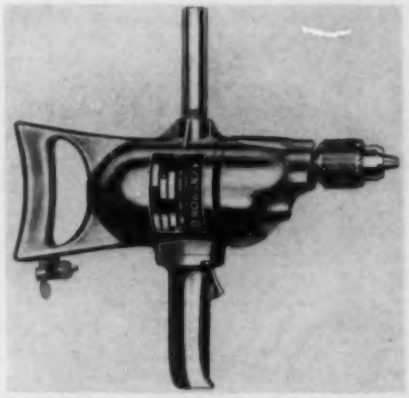
This carrier was originally developed for use in belt conveyors for underground mine use, where a conveyor has to be easy to set up, and easy to move in a limited space.

Multiple V Drive Belt

GOODYEAR TIRE AND RUBBER CO., Akron, Ohio, has designed a close matched multiple V drive, known as the E-C Cord Multi-V Belt. The close matching of the belts used in multiple, it is pointed out, equalizes the strain and load-carrying on all the belts of the assembly, prolongs their life, and produces a better and more efficient drive. The load on the new belt is carried entirely by a layer of heavy, low-stretch, high-tensile cord, placed in a neutral section between rubber high tension and high compression sections. Surface wear is taken by an elastic fabric envelope with the weave on the bias.

Portable Electric Drill of Streamline Design

SYNTRON CO., Homer City, Penn., recognizing the ever-growing demand for modern labor-saving electric tool equipment, has brought out a complete new



All corners are rounded off new electric drill as a safety measure

line of portable electric drills. The ½-in. capacity Model No. 12-S is illustrated herewith.

This ½-in. capacity drill is of streamline design, with all corners rounded off so as not to catch in the operators' clothing. Sturdy cross bar handles, together with an end spade handle provide easy operation. The aluminum shell houses a powerful universal electric motor. The reduction gears are all of heat-treated chrome molybdenum steel, ball-bearing mounted. The three-jaw geared Jacobs chuck accommodates up to ½-in. straight shank drill bits.

This drill is said to be ideal for all-purpose work on production lines, for factory maintenance and for outside rough construction service.

Air Line Freeze Preventive

SULLIVAN MACHINERY CO., Michigan City, Ind., is now producing an additional and improved system of air line and air tool freeze preventive known as "Frosto" to supplement "Tanner Gas" which has proven so successful on construction, industrial and mining operations. This new method has been developed particularly for industrial applications and wherever electric current is available for its operation. In operation, the Frosto is vaporized in a "vaporizer" and is fed into the compressed air line near the compressor as fast as necessary to prevent freezing of water vapor in the compressed air lines and air tools.

Double-Wall Construction

With New Type Block

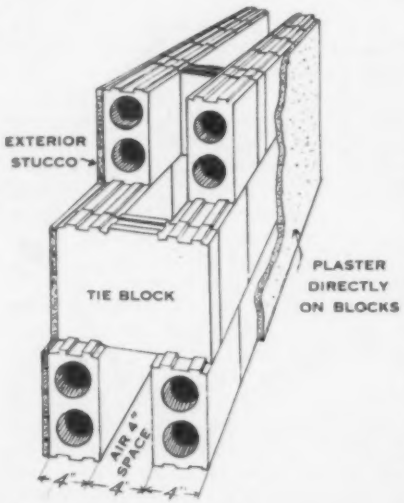
RESIDENTIAL CONSTRUCTION in the past few years has taken a major part of the production of concrete products plants. Those companies which have had available a source of acceptable lightweight aggregates, such as cinders and exploded blast furnace slags, have profited by devoting their attention to the promotion of above ground concrete construction.

Interesting adaptations of concrete products for this type of construction have come from this development, and undoubtedly many more will be originated. Some are untried, while others have found successful application.

A new type building unit, especially fabricated for construction of the more permanent type of fireproof residence, has been sold somewhat extensively in the Southeast and Florida, and is now being made available nationally.

In the accompanying illustration is shown the design and construction of the units. Outside walls constructed with these units are 12 in. thick, and consist of two 4- x 8- x 16-in. blocks with a 4-in. air space to prevent the transference of heat, cold, or moisture. The walls are tied together with regular tie blocks, and all corners are strengthened with reinforced concrete. A reinforced concrete tie beam also engages the top at the ceiling joist height.

With the use of a 4-in. air space, it is claimed that wood furring or wood lath are not necessary, and that plastering can be applied directly to the surface of the interior wall. A thermal conductivity of 0.05 B.t.u. is claimed with the use of rock wool insulation in the air space, and, according to the inventors, lightweight aggregate is not essential, as dry cinders poured between the walls



Cross section of wall built with interlocking concrete blocks

give better insulation than if incorporated in the units, thus the wall has all the strength and low absorption of dense concrete plus higher insulation value.

Hydraulic pressure is used in manufacturing the block, and it is said that compressive strengths exceed those of standard concrete blocks and building code requirements by a wide margin.

Portland cement stucco is applied on the exterior walls and Colorcrete, a waterproof cement paint, is sprayed under pressure as a final coat. Over 50 houses have been built of these units in the southern states.

Fireproof Housing Corp., Oklahoma City, Okla., has patented the system—known as the Scudder double-wall system—and is now offering manufacturing rights and machines on a national scale. A. L. Scudder is president of the company, and Dudley Shaw is vice-president. The Concrete Transport Mixer Company of St. Louis, Missouri is building the machines for the manufacture of the units, and conducting sales thereof.

Typical structure built with Scudder System lightweight concrete blocks

To Provide Old Age Security for Employes

NORTHWEST MAGNESITE CO., Chewelah, Wash., has put into effect a pension plan without cost to employes, as the result of a sincere desire by company officials to create security for their employes in their old age. According to conditions of the plan, an employe after working 25 years is eligible for retirement at the age of 70 at one-third of his pay, and an employe after working 30 years is similarly eligible for retirement at the age of 65. A group insurance plan will also be placed into effect.

Developing Mica Deposits In North Carolina

THE FANNY GOUGE mica mine in Yancey county, N. C., a large producer of high quality mica years ago, is to be reopened, marking the fourth one to be placed into operation since the depression. It is reported that pumping machinery and modern mining equipment are to be installed soon. Other mines opened and now under operation are the Hawk, the Spread Eagle and the Emerald. The availability of more efficient pumping machinery has been instrumental in opening the mines, most of which were abandoned because of difficulty in keeping operations clear of water. In all likelihood other mines in this region will also be reopened.

New Talc Plant In Operation

A NEWLY-FORMED TALC COMPANY has just begun operations in Moore county, N. C., with a plant of 60 tons daily capacity for ground talc. Frank Hines, W. E. Lindsey, Matt Hines, H. O. Woltz and Wilson Barber, all of Mount Airy, N. C., hold a major interest in the company.

THE INDUSTRY

New Incorporations

Seattle Concrete Pipe Co., 7401 Eighth Ave. S., Seattle, Wash., $40,000 filed by W. Harold Hutchinson. Incorporators are Talbot Campbell, A. E. Campbell and W. Harold Hutchinson.

Western Carolina Talc Co., Alexander, N. C., has a charter authorizing the mining and preparation of talc, feldspar, mica and other minerals. Robert C. Freeland, Elsie Whitaker and W. Nixon Gill, all of Asheville, have subscribed $300 of the $50,000 authorized capital.

Thermal City Sand and Gravel Co., Asheville, N. C., has been incorporated for $50,000 authorized capital stock to buy and sell sand and gravel and to operate gravel pits or stone quarries. George A. Shuford, Anthony Redmond and L. L. McCurry, Asheville, have subscribed $300 of the capital stock.

Standard Lime and Stone Co., Baltimore, Md., has changed its Indiana resident agent to Gainor Dewitt Scott, Lafontaine Ave., Wabash.

Ripplemead Lime Co., Inc., Ripplemead, Va., has increased its maximum authorized capital stock from $15,000 to $50,000. Bernard Mason, president, secured the amendment.

Pee Dee Gravel Co., Orangeburg, S. C., has been chartered, with a capitalization of $5000, to mine and process minerals and ores and to wash sand and gravel, crush stone, etc. W. W. Wannamaker, Jr., president, and T. R. McMeekin, secretary and treasurer, have been listed as officers.

Tuskegee Sand and Gravel Co., Tuskegee, Ala., has been organized and incorporated with a paid in capital stock of $20,000. W. G. Mitchell is president of the company, Winton M. Blount, vice-president and general manager, and R. H. Powell, Jr., secretary. The new company has purchased 600 acres of gravel land and will erect a washing plant under the supervision of the Smith Engineering Works, Milwaukee, Wis.

Cardiff Gypsum Co., Fort Dodge, Iowa, has filed amended and substituted articles of incorporation with the Iowa Secretary of State, to expire December 2, 1957. Officers of the company are Ezra Sensibar, president; Maurice J. Breen, vice-president; C. W. Gadd, treasurer; Ira J. MacConnell, secretary; and Phillip Loomer, assistant secretary.

Miami Concrete Products Co., Inc., Miami, Fla., incorporated for 50 shares, no par value. Peter Verhey, J. Verhey and H. R. Carr, directors.

Crescent Pump Co., Detroit, Mich., has sold out to **Vacuum Systems, Inc.**, 436 the Arcade, Cleveland, Ohio. The company has transferred its exclusive rights, titles, patents, patent rights, equipment and the like. Mr. William A. Hatch, Inventor of the Crescent Pump, will be head of the engineering department and general consultant for all vacuum problems. The officers of the company are Louis H. Mesker, president, B. F. Hathaway, vice-president, H. W. Dosey, vice-president and W. L. Holloway, secretary.

Obituaries

Augustus R. Drexel, president of the Drexel Lime and Cement Co., Santa Barbara, Calif., died November 3, from a heart attack. Mr. Drexel was born in Omaha, Neb., November 22, 1865, and for many years was with the Southwestern Portland Cement Co. He came to Santa Barbara in 1918 as this company's representative, and had been active in local and county construction circles up to the time of his death. Mr. Drexel is survived by his wife, daughter, and a brother and sister.

Albert O. Ohlemacher, 80, secretary-treasurer of the Producers Core Sand Corp., died November 1, at Michigan City, Ind. Mr. Ohlemacher was born in Aurora, Ill. He is survived by a son, Fred Ohlemacher, a daughter, three sisters, and one brother.

J. B. Smyth, president of the Uvalde Rock Asphalt Co., San Antonio, Tex., was killed in an automobile accident on October 28. Mr. Smyth, who was 68 at the time of his death, had been president of the asphalt company since its organization in 1922.

James R. Stirrat, a pioneer Seattle, Wash., resident and identified with several industrial minerals companies in the Northwest, died October 23, at the age of 72. Mr. Stirrat was a director of the Pioneer Sand & Gravel Co., and a former vice president of the Superior Portland Cement Co., and the Independent Asphalt Paving Co. He was a partner in the large general contracting firm of Stirrat & Goetz, owner of the Seattle Brick & Tile Co., and a director of the National Steel Rolling Mills. Mr. Stirrat had charge of the installation of the first permanent paving in Seattle; the first concrete sidewalk; the first brick sewer; and also laid the first water main in the city.

George M. Hetzel, 68, second vice president of the McGovern Granite Co., Hartford, Conn., died October 30. Although a stone cutter by trade, Mr. Hetzel entered the police department of Hartford, serving for 20 years. He resigned in May, 1920 to become associated with the McGovern Co., monument makers, which later became the McGovern Granite Co.

Carl Price, president of the Kenton Marble and Granite Co., Kenton, Ohio, died on November 6, at the age of 69, after an extended illness. Mr. Price bought an interest in the firm in 1893, and continued actively in business up to the time of his death.

Marion Graupner, son of H. W. Graupner, local sales manager of the Marquette Cement Manufacturing Co., at Memphis, Tenn., was found dead recently in the office of the Wolf River Sand & Gravel Co., Memphis.

Lawrence Lang, a veteran salesman of the Universal Atlas Cement Co., Cleveland, Ohio died recently as a result of injuries received in a fall.

Edward Lea March, a director of United States Gypsum Co., Chicago, died on November 21. Mr. Marsh was elected a director of the company on May 12, 1920. He was elected secretary and treasurer on February 23, 1921, and held that office continuously until his resignation on February 13, 1924. The relation of Mr. Marsh with the company in capacities other than official date back many years; property owned by his father, Edward H. Marsh, at Gypsum, Ohio, having been leased and operated by the United States Gypsum Co., from 1902 to 1919, when the property was purchased.

George Roller, for 22 years production manager of the Michigan Pressed Brick Co., died in Detroit, Mich., October 27. He was born in Sebewaing, Mich., May 21, 1883. Mr. Roller was a popular figure among sand-lime brick manufacturers.

Crushed Stone

Montezuma, Iowa: Poweshiek county is producing crushed stone from a quarry leased on a royalty basis. The fines are sold to local farmers.

Butler, Mo.: A dock quarry is being opened on the Ira Blangy farm southwest of Foster, Mo., to get out stone for two miles of surfacing.

Grand River, Iowa: Decatur County Soil Improvement Association is planning to produce agricultural limestone at the Shields quarry.

Red Wing, Minn.: The Board of Public Works recently opened bids for a jaw crusher to be used for producing gravel.

Canton, N. C.: The city has purchased a rock crusher to be used in producing stone for maintenance of city streets.

Hickory, N. C.: The city has been allocated $27,265 for WPA operation of a stone quarry and rock crusher, stone to be used for improvement of streets. Operations were begun October 6 on two shifts.

Fairfield, Iowa: Operations were begun at the new Jefferson county rock quarry in October.

Pueblo, Colo.: WPA has approved appropriations of $51,270 to operate a stone quarry for the city of Pueblo.

Manufacturers

Link-Belt Co., Chicago, Ill., has made several important changes in its official personnel. Harold L. Hoefman has been appointed manager of the plant, warehouse and sales office at Atlanta, Ga., to succeed I. H. Barbee, who died on November 4. George A. Paige has been made manager of the warehouse and sales office in Detroit. Laurence O. Millard has been appointed district sales manager at Pittsburgh, being transferred from Cleveland, where he held the same position. He is succeeded in Cleveland by Paul V. Wheeler.

General Electric Co., Schenectady, N. Y., recently honored Chas. N. Mason, president of Electrical Securities Corp., and G. E. Employees Securities Corp., both wholly owned associated companies, as a veteran of fifty years' service with the company. Mr. Mason started with the company on November 1, 1887 when he joined the Thomson-Houston Electric Co., in the Boston office. The Thomson-Houston Electric Co., was consolidated with the Edison General Electric Co., in 1892, to become the General Electric Co. Mr. Mason is one of the three living men who have completed a half century of service with the company.

The Worthington-Gamon Meter Co., Harrison, N. J., has appointed W. C. Flanders to the position of sales manager. Mr. Flanders succeeds G. H. Gleeson, formerly vice president in charge of sales, resigned.

The Lincoln Electric Co., Cleveland, Ohio, has announced the appointment of Robert H. Schuster to the sales staff of the Pittsburgh office. Mr. Schuster will be working under the direction of W. R. Persons, who was recently appointed district manager of the Pittsburgh office.

Morris Machine Works, Baldwinsville, N. Y., has appointed the Lang Co., as their representative in Salt Lake City, with offices at 267 W. First South St. The Lang Co. will handle sales of centrifugal pumps and hydraulic dredges.

General Electric Co., Schenectady, N. Y., board of directors elected James H. Perkins a member of the board at the November 19 meeting. Mr. Perkins is chairman of the board of directors of the National City Bank of New York.

Claude B. Schneible Co., Chicago, Ill., has announced the appointment of Hygo Kuroske as sales manager. This company manufactures the Schneible multi-wash dust collector.

Babcock & Wilcox Tube Co., Beaver Falls, Pa., will be represented by Clowe & Cowan, Inc., Amarillo and Lubbock, Tex., as distributors for seamless tubular products in the Texas Panhandle, South Plains, and eastern New Mexico, according to a recent announcement. Uhrich Supply Co., Kansas City, Mo., has been appointed distributor in the Kansas City trade territory, western Missouri, and Kansas.

Patterson Foundry & Machine Co., East Liverpool, Ohio, has announced the appointment of E. S. Boston as district sales manager with headquarters in St. Louis. Mr. Boston is a chemical engineer, having graduated from the University of Wisconsin and the Armour Institute of Technology at Chicago. He was formerly connected with the laboratory of the Anaconda Copper Mining Co., and the Ohio Zinc Oxide Co.

Slag Company to Produce Silica

BIRMINGHAM SLAG CO., Birmingham, Ala., has negotiated a 25-yr. lease on the Mohawk sand deposits near Chatchee in Calhoun county and is planning to launch extensive quarrying operations there. A subsidiary corporation, the Mohawk Silica Corp., will develop the silica deposit, which is claimed to be one of the purest in the United States. Outcroppings of the deposit indicate that more than 100,000,000 tons of silica, capable of making high-grade plate glass and optical lenses, are available. Equipment costing about $50,000 is to be installed and operations are to begin about January 1, 1938, according to reports.

Delay in Enforcing Cement Inspection Tax

FLORIDA ROAD DEPARTMENT officials are withholding the enforcement of the recently-imposed $3 a ton inspection tax on foreign cement until a contest of the law is made in a three-judge federal court at New Orleans, La.

Establish Amiesite Plant at Quarry

SUBURBAN CONSTRUCTION CO., Ardmore, Penn., is establishing an amiesite plant at the plant of Whiterock Quarries, Inc., Pleasant Gap, Penn., to be near a source of supply of limestone. About 12 men will be employed in the plant, which is being moved from Winfield, Penn.

Sues Stone Plant For Injuries

BASALT ROCK CO., INC., Napa, Calif., was recently sued for $50,000 by Mrs. Lena Mix for injuries sustained in an automobile accident involving a truck driven by an employe of the company.

California Concern Buys Second Stone Plant

SAN GORGONIO ROCK PRODUCTS CO., Banning, Calif., has taken over a dolomite quarry at Riverside, Calif. The capacity of the latter plant is 250 tons per day, the production largely going to the steel trade. New equipment is being installed.

GEORGE MCCRAE, Toronto, Canada, is planning to build two plants, each one of which will produce 50,000 tons of limestone annually, carbon dioxide, lime, and a high-in-lime quick hardening cement.

Let Contracts For Completion of Grand Coulee

UNITED STATES BUREAU OF RECLAMATION, Denver, Colo., will open bids for the completion of Grand Coulee Dam on December 10. The new contract will require more than 7,000,000 bbl. of cement and the placement of 5,800,000 cu. yd. of concrete. The contract of the MWAK company is to be completed early in December.

Old Quarry Producing Agricultural Lime

FREDERICK HAZEN, Somerville, Mass., has leased the old lime quarry and kiln at Bolton, Mass., and will install modern equipment for the production of limestone and agricultural lime. The quarry to be operated has been inactive for 100 years.

Gifford-Hill Acquires Another Plant

GIFFORD-HILL AND CO., INC., Dallas, Texas, has acquired the plant of Riverside Gravel Co., Minden, La., and is now operating it. The plant is being improved by installation of a new 10-in. suction dredge. E. Willis, Minden, is superintendent of the plant.

To Build New Lime Plant in Arkansas

EDGAR BAKER and associates of Batesville, Ark., has started construction of a new lime plant at the St. Clair Marble Co. quarry near Guion. The marble company will furnish the kiln stone. Capacity of the two kilns to be installed will be 40 tons a day.

ARKANSAS GEOLOGICAL SURVEY has made application to WPA for a grant of $3936 to be used in the drilling of test holes near Little Rock in search of limestone.

Prices Bid—Contracts Let

AKRON, OHIO: W. E. Wright Co. has been awarded the contract for 100 tons of limestone dust at $4.50 a ton to be used in finishing the runways at Akron's municipal airport. The dust is to be delivered in 100-lb. sacks as needed.

SPRINGFIELD, ILL.: Lincoln Sand and Gravel Co., Lincoln, Ill., has been awarded a contract by the Sangamon county board of supervisors for 2000 tons of gravel at $1.18 a ton. The gravel is to be used on a WPA project.

YUBA CITY, CALIF.: Valley Concrete Pipe and Products Co., Yuba City, has been awarded a contract by the California State Procurement Office, U. S. Treasury Dept., to furnish 2000 ft. of 12-in. concrete pipe at 31.5c f.o.b. Yuba City.

CONCHAS DAM, N. M.: United States Engineering office, Tucumcarie, has approved the bid of the Southwestern Portland Cement Co., Los Angeles, Calif., to furnish 250,000 bbl. portland cement at $2.47 per bbl. The cement is to be used in construction of Conchas Dam on South Canadian river.

NEW YORK, N. Y.: Treasury Department, Procurement division, has awarded a $20,462 contract to Colonial Sand and Stone Co., New York, to furnish stone for WPA projects; asphaltic concrete, $12,094, to Highway Improvement and Repair Co., New York.

OAKLAND, CALIF.: U. S. Forest Service, Government Island, awarded contract for 1755 bbl. portland cement to Calaveras Cement Co., San Francisco, at $1.89 per bbl. f.o.b. Kentucky House.

SACRAMENTO, CALIF.: Lord and Bishop, Sacramento, has a government contract to furnish 2000 tons rip rap stone dumped as directed along the Sacramento river at $2.50 a ton.

LOS ANGELES, CALIF.: United States Engineers have awarded contract for 7800 tons coarse aggregate to Consolidated Rock Products Co., Los Angeles, at $1.57 a ton.

RALEIGH, N. C.: Purchase and Contracts Division has awarded contracts for concrete pipe to Gray Concrete Pipe Co., Thomasville, as follows: 320 ft. reinforced concrete pipe, bell and spigot type, at $1.32 per ft. f.o.b. Jacksons Stores; 114 ft., f.o.b. Elizabeth City, at $1.72 per ft.; 360 ft. f.o.b. prison camp near Gatesville, $1.15 per ft.; 200 ft., f.o.b. Sligo, at $1.18 per ft.

FRESNO, CALIF.: Jourdan Concrete Pipe Co., Fresno, has U. S. Treasury Dept. contract to furnish 1100 ft. 30-in. reinforced concrete pipe at $2.10 per ft. net. Pipe are to be delivered f.o.b. vendor's plant or terminal within a five-mile radius of Fresno or f.o.b. cars Fresno.

INDIANAPOLIS, IND.: State Highway Commission has awarded contract to Western Indiana Gravel Co., West Lafayette, Ind., to furnish 500 to 1000 tons size 8 and 500 to 800 tons size 11 crushed gravel, both 35 percent crushed, at $1 per ton f.o.b. plant; 1000 to 1500 tons size 2 and 300 to 500 tons size 10 (screenings) to Pipe Creek Stone Co., Marion, at $1.53 per ton delivered to state road 221; 800 to 1000 tons size 7, 35 percent crushed, to France Stone Co. at $1.50 a ton delivered to state road 25; 1000 to 1600 tons size 7, 35 percent crushed, to American Aggregates Corp., Logansport, at $1.50 per ton delivered to state road 35.

SACRAMENTO, CALIF.: City council has accepted bid of Del Paso Rock Products Co., Sacramento, to supply 1000 tons asphaltic concrete at $3.50 per ton.

INDIANAPOLIS, IND.: State Highway Commission has approved bid of Erie Stone Co., Indianapolis, to deliver 100 to 200 tons size 11, and 400 to 800 tons size 9 crushed stone at $1.40 per ton f.o.b. Rochester, Ind.; 750 to 1000 tons size 7 crushed stone, 35 percent crushed, delivered to state road 26; 500 to 700 tons screenings to Sellersburg-Stone Co., Sellersburg, at $1.47 per ton delivered to state road 31.

SAN FRANCISCO, CALIF.: United States Engineers, Custom House, has awarded contract to Pacific Portland Cement Co., San Francisco, for 550 bbl. portland cement at 2.11 per bbl. f.o.b. Yerba Buena Island in San Francisco Bay.

PARCO, WYO.: Monolith Portland Midwest Co., Laramie, Wyo., has Bureau of Reclamation contract to deliver 4000-bbl. modified portland cement for Seminole dam at $1.85 per bbl.

Building Concrete Block Plant

D. M. LUNDELL, Red Wing, Minn., is building a 22 x 40 ft. block plant and a 12 x 12 ft. gravel bin at a cost of $1500. Mr. Lundell has been manufacturing concrete blocks in the open.

Gets Permit to Dredge Gravel

OHIO RIVER SAND AND GRAVEL CO., Parkersburg, W. Va., has been granted a federal permit to dredge material from the Ohio river betwen Pittsburgh, Penn., and Steubenville, Ohio.

Argue Gravel Prices In Dodge County, Nebraska

RODNEY DUNLAP, Fremont attorney, appeared at a mass meeting in Scribner, Nebr., recently as counsel for owners of several gravel pits in a price dispute. J. J. Courtright had offered gravel to the county at 23c per cu. yd. and offered to donate 60 acres of land to the county on the basis of a minimum amount of gravel. Present gravel prices in Dodge county run about 40c a cu. yd., varying according to location.

City to Produce Aggregates

WEST MEMPHIS, ARK., went into the sand and gravel business recently with acquisition of a gravel pit on the Scott Miller plantation near Wynoke. The move was made supposedly to reduce construction costs to the city.

To Produce Terrazzo Chips In Georgia

A TEXAS CONCERN will operate a quarry and crushing plant in northwest Georgia in undeveloped marble deposits, according to a recent report. The deposit under question has gone undeveloped because the bedding is too thin to produce dimension stone. Terrazo chips will be produced.

New Dredging Plant In Operation

SAN-ORE CONSTRUCTION CO., INC., McPherson, Kan., is operating a new, permanent sand and gravel plant on the Earl Porter farm near Beloit, Kan. Stripping of about six or eight feet of soil was removed by Diesel tractors, and gravel is being excavated from the pit by an 8-in. pump. The gravel vein is about 15 ft. in depth.

Virginia To Have More State Competition

VIRGINIA STONE PRODUCERS are to take it on the chin again when plans for a new state-operated limestone plant are realized. The proposed plant, to be established on the H. H. Moore farm near Beckam, in Appomattox county, will serve farmers in eight or ten counties. Agricultural stone is to be sold at actual cost to the farmers.

Iowa Concern Has Some Good Orders

DOUDS STONE CO., Douds, Iowa, is reported to be very busy in the production of road gravel. The company has a large contract for washed sand used in the construction of a reservoir at Bloomfield, Iowa. A new office is to be built with a new pressed block termed "Stonecrete."

IT TOOK 400,000 TONS FOR A RIDE

AWAY back in March 1928 a large Pennsylvania stone company called in the G. T. M. — Goodyear Technical Man — and asked him to specify a belt for a new elevator being installed in their quarry. On his recommendation a Goodyear Style RC Elevator Belt, with an 8-ply carcass of heavy closely-woven 35 ounce silver duck, was installed.

This belt was fitted with one hundred twenty buckets, each weighing 70 pounds, each having a capacity of 150 pounds of stone ranging from fines to 6" size, putting a total load of over eight tons on this belt while in use. Operating approximately 60% of the time each year it elevated over 400,000 tons of stone before being replaced last March—*after giving nine years of trouble-free service!*

Let the GTM help you

In any operation requiring conveyor or elevator belting, G. T. M.-specification assures the same long, low-cost service. Goodyear heavy duty elevator belts are built with a skim coat between each ply to reduce the possibility of separation and minimize penetration of moisture at the bolt holes. The extra heavy carcass resists any tendency of the bolt heads to pull through and the tough rubber cover is specially compounded to withstand severest abrasion—which explains their exceptionally long life.

If you have never consulted the G.T.M. it will pay you to make his acquaintance. You will find him a friendly adviser whose long experience meeting all types of quarrying problems may benefit you. To bring him to your plant, write Goodyear, Akron, Ohio, or Los Angeles, California — or the nearest Goodyear Mechanical Rubber Goods Distributor.

THE GREATEST NAME IN RUBBER

GOODYEAR

Classified Directory of Advertisers in this Issue of ROCK PRODUCTS

For alphabetical index, see page 110

Aggregate De-Dusters
Western Precipitation Co.

Agitators, Thickeners and Slurry Mixers
The Dorr Co.
Hardinge Co., Inc.
F. L. Smidth & Co.

Air Compressors
Fuller Co.
Gardner-Denver Co.
Nordberg Mfg. Co.
F. L. Smidth & Co.

Air Filters
Fuller Co.

Air Filter Frames
Fuller Co.

Air Separators
Hardinge Co., Inc.
Raymond Pulverizer Division
W. W. Sly Mfg. Co.
Sturtevant Mill Co.
Western Precipitation Co.
Williams Patent Crusher & Pulv. Co.

Airveyor
Fuller Co.

Alloys (Metal)
Chicago Steel Foundry Co.

Ash & Refuse Handling Equipt.
Allen-Sherman Hoff Co.

Backfillers
Bucyrus-Erie Co.

Balls, Grinding, (See Grinding Balls)

Balls (Tube Mill, etc.)
Allis Chalmers Mfg. Co.
Carnegie-Illinois Steel Corp. (United States Steel Corp. Subsidiary)
Hardinge Co., Inc.
F. L. Smidth & Co.
Traylor Engineering & Mfg. Co.

Bar Benders and Cutters
Koehring Co.

Batchers, Measuring Volume
Besser Mfg. Co.
Fuller Company
Jaeger Machine Co.

Bearings
Chain Belt Co.
Link-Belt Co.
Standard Pressed Steel Co.
Timken Roller Bearing Co.

Bearings (Anti-Friction)
Standard Pressed Steel Co.
Timken Roller Bearing Co.

Bearings (Roller)
Timken Roller Bearing Co.

Bearings (Tapered Roller)
Timken Roller Bearing Co.

Bearings (Thrust)
Timken Roller Bearing Co.

Belt Fasteners
Flexible Steel Lacing Co.

Belting
Robins Conveying Belt Co.

Belt Lacing (Steel)
Flexible Steel Lacing Co.

Belting (Elevator and Conveyor)
B. F. Goodrich Co.
Goodyear Tire & Rubber Co., Inc.

Belting (Transmission)
B. F. Goodrich Co.
Goodyear Tire & Rubber Co., Inc.

Belting (V Type)
B. F. Goodrich Co.
Goodyear Tire & Rubber Co., Inc.

Bin Gates
Allen-Sherman-Hoff Co.
Chain Belt Co.
Fuller Co.
Geo. Haiss Mfg. Co., Inc.
Industrial Brownhoist Corp.
Link-Belt Co.

Bins, Hoppers
Besser Mfg. Co.
Blaw-Knox Co.

Bins, Storage (Steel)
Besser Mfg. Co.
Pioneer Gravel Equipt. Mfg. Co.

Blasting Cap Protectors
B. F. Goodrich Co.

Block Machines, Building
Anchor Concrete Machinery Co.
Besser Mfg. Co.
Multiplex Concrete Machy Co.
Stearns Mfg. Co.

Block Machines, Silo
Besser Mfg. Co.

Blocks (Pillow, Roller Bearing)
Link-Belt Co.
Standard Pressed Steel Co.
Timken Roller Bearing Co.

Blowers
W. W. Sly Mfg. Co.

Bodies (Motor Truck)
Hug Co.

Boilers
Babcock & Wilcox Co.
Combustion Engineering Corp.

Bolts
Standard Pressed Steel Co.

Boots and Shoes
B. F. Goodrich Co.

Breakers (Primary)
Smith Engineering Works
Traylor Engineering & Mfg. Co.
Williams Patent Crusher & Pulv. Co.

Brick Machines
Besser Mfg. Co.

Buckets (Clamshell, Grab, Orange Peel, etc.)
Blaw-Knox Co.
Geo. Haiss Mfg. Co., Inc.
Hayward Company
Industrial Brownhoist Corp.
Link-Belt Co.
Owen Bucket Co.
Wellman Engineering Co.

Buckets (Dragline and Slackline)
Blaw-Knox Co.
Bucyrus-Erie Co.
Owen Bucket Co.
Wellman Engineering Co. (G. H. Williams)

Buckets (Dredging and Excavating)
Geo. Haiss Mfg. Co., Inc.
Owen Bucket Co.

Buckets (Elevator and Conveyor)
Chain Belt Co.
Hendrick Mfg. Co.
Industrial Brownhoist Corp.
Jeffrey Mfg. Co.
Link-Belt Co.
Pettibone Mulliken Corp.
Robins Conveying Belt Co.

Bulldozers
Blaw-Knox Co.
Bucyrus-Erie Co.
Koehring Co.

Bullscrapers
Bucyrus-Erie Co.

Cableways
Bethlehem Steel Co.
Broderick & Bascom Rope Co. (Yellow Strand)
General Electric Co.
Link-Belt Co.
Roebling's, John A., Sons Co.
Sauerman Bros.
Wellman Engineering Co. (G. H. Williams)

Calcinators
Traylor Engineering & Mfg. Co.

Cap Crimpers and Fuse Cutters
Ensign-Bickford Co.

Car Movers (Freight)
Appleton-Atlas Car Mover Corp.

Car Pullers
Link-Belt Co.

Cars (Dump)
Carnegie-Illinois Steel Corp. (United States Steel Corp. Subsidiary)

Cars (Quarry & Gravel Pit)
Carnegie-Illinois Steel Corp. (United States Steel Corp. Subsidiary)

Cars and Track, Industrial
Besser Mfg. Co.

Castings
Babcock & Wilcox Co.
Birdsboro Steel Fdry. & Mach. Co.
C. G. Buchanan Co., Inc.
Chicago Steel Foundry Co.
Eagle Iron Works (Grey Iron)
Link-Belt Co.
Timken Roller Bearing Co.

Cement Making Machinery
F. L. Smidth & Co.
Traylor Engineering & Mfg. Co.

Cement Paints
Tamms Silica Co.

Cement Process
Cement Process Corp.

Cement Pumps
Fuller Co.
F. L. Smidth & Co.

Central Mixing Plants (Concrete)
Blaw Knox Co.
Chain Belt Co.
Jaeger Machine Co.

Chain (Dredge and Steam Shovel)
Bucyrus-Erie Co.
Jeffrey Mfg. Co.

Chain Drives
Chain Belt Co.

Chain (Elevating and Conveying)
Chain Belt Co.
Jeffery Mfg. Co.
Link-Belt Co.
Pettibone Mulliken Corp.

Chain Systems (Kilns)
F. L. Smidth & Co.

Chimney Block Machines and Molds
Besser Mfg. Co.

Chutes and Chute Liners
Earl C. Bacon, Inc.

Clarifiers
The Dorr Co.
Hardinge Co., Inc.

Classifiers
Allen Cone & Machy. Corp.
The Dorr Co.
Hardinge Co., Inc.
Link-Belt Co.
Nordberg Manufacturing Co.

Clips (Wire Rope)
Allen Cone & Machy. Corp.
Bethlehem Steel Co.
Broderick & Bascom Rope Co. (Yellow Strand)

Coal Crushers and Rolls
Williams Patent Crusher & Pulv. Co.

Coal Pulverizing Equipment
Babcock & Wilcox Co.
Gruendler Crusher & Pulv. Co.
Hardinge Company, Inc.
Pennsylvania Crusher Co.
Raymond Pulverizer Division
F. L. Smidth & Co.
Williams Patent Crusher & Pulv. Co.

Collars (Shafting)
Standard Pressed Steel Co.

Colors, Cement
Geo. S. Mepham Corp.
Tamms Silica Co.

Compressed Air Hoists
Gardner-Denver Co.

Compressed Air Rock Drills
Gardner-Denver Co.

Compressors (See Air Compressors)

Concentrators (Slurry, etc.)
The Dorr Co.

Concrete Pipe Machinery
Quinn Wire & Iron Works

Concrete Slab Raising Equipment (Mud-Jack)
Koehring Co.

Conveyor Belting (See Belting)

Conveyor Idlers and Rolls
C. O. Bartlett & Snow Co.
Chain Belt Co.
Jeffrey Mfg. Co.
Link-Belt Co.

Conveyors and Elevators
Earle C. Bacon
Besser Mfg. Co.
Chain Belt Co.
Fuller Company
Geo. Haiss Mfg. Co., Inc.
Industrial Brownhoist Corp.
Jeffrey Mfg. Co. (Vibrating)
Lewistown Fdy. & Mach. Co.
Link-Belt Co.
Robins Conveying Belt Co.
F. L. Smidth & Co.
Smith Engineering Works
Sturtevant Mill Co.
Williams Patent Crusher & Pulv. Co.

Conveyors (Hydro Vacuum)
Allen-Sherman Hoff Co.

Conveyors (Pneumatic)
Fuller Company

Conveyors (Screw)
Link-Belt Co.

Conveyors (Spiral)
Jeffrey Mfg. Co.

Correcting Basins
F. L. Smidth & Co.

Couplings (Flexible and Shaft)
Chain Belt Co.
Link-Belt Co.
Standard Pressed Steel Co.

Couplings (Hose, Pipe, etc.)
B. F. Goodrich Co.

Cranes (Clamshell)
Bucyrus-Erie Co.
Koehring Co.

Actual photograph of a Gulf lubrication engineer in consultation with the Chief Engineer of a widely known Diesel power plant. Every day, Gulf engineers are "in the picture" in scores of plants from Maine to Texas—helping to reduce operating costs through better lubrication.

"We Welcome THE GULF ENGINEER IN OUR PLANT..."

...he helps us keep maintenance costs down!" ... SAYS THE MANAGER OF THIS BIG PLANT

IT'S not his ready and tactful cooperation alone that makes the Gulf engineer a welcome visitor to this and many another Diesel power plant. The results of his work show up in lowered repair bills and better performance from power units. No wonder the door is always open to him!

Here is the Gulf engineer's aim: *to increase the efficiency* of Diesel operation through improved lubrication. His experience embraces scores of plants and he is prepared to recommend the proper lubricants and the best application methods for the equipment in your plant, regardless of its age, size or type.

Any Diesel operator can have the benefit of this cooperative engineering service. It is extended to all users of Gulf quality lubricants—from Maine to Texas —without charge.

GULF OIL CORPORATION — GULF INDUSTRIAL LUBRICATION — GULF REFINING COMPANY

GENERAL OFFICES: GULF BUILDING, PITTSBURGH, PA.

Makers of Gulf No-Nox Ethyl Gasoline and Gulfpride Oil

Classified Directory—*Continued*

Cranes (Crawler and Locomotive)
Bucyrus-Erie Co.
Harnischfeger Corp.
Industrial Brownhoist Corp.
Koehring Co.
Link-Belt Co.
Marion Steam Shovel Co.
Michigan Power Shovel Co.
Northwest Engineering Co.

Cranes (Excavator)
Koehring Co.

Cranes (Overhead Traveling Electric)
Industrial Brownhoist Corp.

Crusher Parts
American Pulverizer Co.
Birdsboro Steel Fdry. & Mach. Co.
C. G. Buchanan Co., Inc.
Pennsylvania Crusher Co.
Traylor Engineering & Mfg. Co.

Crushers (Hammer)
American Pulverizer Co.
The C. O. Bartlett & Snow Co.
Carnegie-Illinois Steel Corp. (United States Steel Corp. Subsidiary)
Dixie Machy. Mfg. Co.
Gruendler Crusher & Pulv. Co.
Jeffrey Mfg. Co.
Pennsylvania Crusher Co.
Sturtevant Mill Co.
Williams Patent Crusher & Pulv. Co.

Crushers (Jaw and Gyratory)
Allis-Chalmers Mfg. Co.
Earle C. Bacon, Inc.
Birdsboro Steel Foundry & Mach. Co.
C. G. Buchanan Co., Inc.
Gruendler Crusher & Pulv. Co.
Jeffrey Mfg. Co.
Lewistown Fdy. & Mach. Co. (Jaw)
New Holland Machine Co.
Nordberg Mfg. Co.
Pennsylvania Crusher Co.
Smith Engineering Works
Williams Patent Crusher & Pulv. Co.

Crushers (Reduction)
Earle C. Bacon, Inc.
Birdsboro Steel Fdry. & Mach. Co.
C. G. Buchanan Co., Inc.
Jeffrey Mfg. Co.
Traylor Engineering & Mfg. Co.

Crushers (Ring)
American Pulverizer Co.

Crushers (Roll)
American Pulverizer Co.
Gruendler Crusher & Pulv. Co.
New Holland Machine Co.
Pioneer Gravel Equipt. Mfg. Co.
Williams Patent Crusher & Pulv. Co.

Crushers (Rotary)
American Pulverizer Co.

Crushers (Single Roll)
American Pulverizer Co.
Gruendler Crusher & Pulv. Co.
Jeffrey Mfg. Co.
Link-Belt Co.
McLanahan & Stone Corp.
New Holland Machine Co.
Pennsylvania Crusher Co.

Crushing Rolls
Allis-Chalmers Mfg. Co.
Babcock & Wilcox Co.
Birdsboro Steel Foundry & Mach. Co.
C. G. Buchanan Co., Inc.
Jeffrey Mfg. Co.
New Holland Machine Co.
Pettibone Mulliken Corp.
Sturtevant Mill Co.

Curing Racks
Multiplex Concrete Machy Co.

Dedusters
Blaw-Knox Co.

Dewatering Machines
The Dorr Co.

Diaphragms (Pump)
B. F. Goodrich Co.

Dippers & Teeth
Marion Steam Shovel Co.
Pettibone Mulliken Corp.

Dippers and Teeth (Steam Shovel)
Bucyrus-Erie Co.
Frog, Switch & Mfg. Co.

Dirt Moving Equipt. (Dumptor)
Koehring Co.

Ditchers
Bucyrus-Erie Co.
Marion Steam Shovel Co.

Draglines
Bucyrus-Erie Co.
Link-Belt Co.
Marion Steam Shovel Co.
Northwest Engineering Co.

Draglines (Gasoline or Electric)
Koehring Co.

Dragline Cableway Excavators
Bucyrus-Erie Co.
Link-Belt Co.
Marion Steam Shovel Co.
Sauerman Bros., Inc.

Dragline Excavators
Bucyrus-Erie Co.
Marion Steam Shovel Co.
Michigan Power Shovel Co.
Northwest Engineering Co.

Dredge Pumps (See Pumps, Dredging)

Dredges
Bucyrus-Erie Co.
Hayward Co.
Hetherington & Berner, Inc. (Complete Steel)
Marion Steam Shovel Co.
Morris Machine Works

Dredging Sleeves
B. F. Goodrich Co.

Drill Bits
Timken Roller Bearing Co.

Drilling Accessories
Gardner-Denver Co.

Drills
Bucyrus-Erie Co.
Timken Roller Bearing Co.

Drills, Hammer (See Hammer Drills)

Drills (Rock)
Gardner-Denver Co.

Drives (Short Center) See also Belting, etc.
Allis-Chalmers Mfg. Co.
Earle C. Bacon, Inc.

Dryers
Allis-Chalmers Mfg. Co.
Babcock & Wilcox Co.
Combustion Engineering Corp.
Hardinge Company, Inc.
W. S. Tyler Co.
Western Precipitation Co.

Dumptors
Koehring Co.

Dust Arresters
W. W. Sly Mfg. Co.
Western Precipitation Co.

Dust Collecting Systems
Allen Sherman Hoff Co.
Allis-Chalmers Mfg. Co.
The C. O. Bartlett & Snow Co.
Blaw Knox Co.
Pettibone Mulliken Corp.
Western Precipitation Co.

Dust Conveying Systems
Fuller Company
Western Precipitation Co.

Dust Handling Systems (Hydro Vacuum)
Allen-Sherman Hoff Co.

Electric Cables and Wires
Roebling's, John A., Sons Co.

Electric Mine Hoists
Allis-Chalmers Mfg. Co.
Nordberg Mfg. Co.

Electric Power Equipment
Allis-Chalmers Mfg. Co.
General Electric Co.

Classified Directory—*Continued*

Elevator Belting (See Belting)

Emery Mills
Sturtevant Mill Co.

Engineers
The Dorr Co.
Fuller Co.
Hetherington & Berner, Inc.
Productive Equipment Corp.
Robins Conveying Belt Co.
F. L. Smidth & Co.
Sturtevant Mill Co.
Traylor Engineering & Mfg. Co.
Williams Patent Crusher & Pulv. Co.

Engines (Diesel)
National Supply Co.
Nordberg Mfg. Co.

Excavating Machinery (See Shovels, Cranes, Buckets, etc.)

Excavators (Crawling Tractor)
Koehring Co.

Excavators (Dragline)
Koehring Co.

Fans
General Electric Co.

Fans (Exhaust)
W. W. Sly Mfg. Co.

Feeders
Allis-Chalmers Mfg. Co.
Babcock & Wilcox Co. (Pulverized Coal)
Barle C Bacon, Inc.
Besser Mfg. Co.
Chain Belt Co.
Fuller Co. (Cement and Pulverized Material)
Hardinge Company, Inc. (Weighing)
Jeffrey Mfg. Co. (Pan & Tube)
Robins Conveying Belt Co.
Ross Screen & Feeder Co.
Smith Engineering Works (Plate)
Stearns Mfg. Co.
Traylor Engineering & Mfg. Co.

Feeders (Weighing)
Schaffer Poidometer Co.

Filters (Air)
W. W. Sly Mfg. Co.

Filters (Dust)
W. W. Sly Mfg. Co.

Floor Sweeping Systems (Hydro Vacuum)
Allen-Sherman Hoff Co.

Forges (Oil)
Gardner-Denver Co.

Forgings (Steel)
Manganese Steel Forge Co., Inc.

Furnaces
Combustion Engineering Corp.

Fuses
General Electric Co.

Fuses (Detonating and Safety)
Ensign-Bickford Co.

Gaskets
B. F. Goodrich Co.
Goodyear Tire & Rubber Co., Inc.

Gasoline
Texas Company

Gears (Spur, Helical and Worm)
Jeffrey Mfg. Co.

Gears and Pinions
Chain Belt Co.
General Electric Co.
Link-Belt Co.
Pettibone Mulliken Corp.

Gelatin and Semi-Gelatin (See Explosives)

Grapples
Blaw Knox Co.
Hayward Co.
Owen Bucket Co.

Grease
Gulf Refining Co.
Texas Company

Grinding Balls
Babcock & Wilcox Co.
Carnegie-Illinois Steel Corp. (United States Steel Corp. Subsidiary)
Jeffrey Mfg. Co.

Grizzlies
Jeffrey Mfg. Co. (Vibrating)
Pettibone Mulliken Corp.
Robins Conveying Belt Co.
Smith Engineering Works

Grizzly Feeders
Jeffrey Mfg. Co.
Traylor Engr. & Mfg. Co.

Hammer Mills (See Crushers)

Hoists
Jaeger Machine Co.
Link-Belt Co.
Northwest Engineering Co.

Hose (Water, Steam, Air Drill, Pneumatic, Sand Suction and Discharge)
B. F. Goodrich Co.
Goodyear Tire & Rubber Co., Inc.

Hose Couplings (See Couplings—Hose, Pipe, etc.)

Hydrators
Blaw-Knox Co.

Insulation (Electric)
General Electric Co.

Kilns (Shaft)
Hardinge Company, Inc

Kilns and Coolers (Rotary
Allis-Chalmers Mfg. Co.
Blaw-Knox Co.
Hardinge Co., Inc.
F. L. Smidth & Co.

Kominuters (See Mills)

Laboratory Crushers
Birdsboro Steel Foundry & Machine Co.
C. G. Buchanan Co., Inc.
Sturtevant Mill Co.
Williams Patent Crusher & Pulv. Co.

Lamp Guards
Flexible Steel Lacing Co.

Lighters, Hot Wire (For Safety Fuse)
Ensign-Bickford Co.

Lime Handling Equipment
Fuller Company
Hardinge Co., Inc.
Link-Belt Co.
Raymond Pulverizer Division

Lime Kilns (See Kilns and Coolers, Rotary)

Linings (Iron for Ball and Tube Mills) (See Mill Liners)

Linings (Rubber for Chutes, Ball and Tube Mills, Tank and Pipe)
B. F. Goodrich Co.

Loaders and Unloaders
Bucyrus-Erie Co.
Fuller Company
Geo. Haiss Mfg. Co., Inc.
Jeffrey Mfg. Co.
Link-Belt Co.
Marion Steam Shovel Co.
Northwest Engineering Co.
Robins Conveying Belt

Locomotive Cranes (See Cranes, Crawler and Locomotive)

Locomotives (Diesel Electric)
Davenport-Besler Corp.

Locomotives (Diesel Mechanical)
Davenport-Besler Corp.

Locomotives (Gas-Electric)
Davenport-Besler Corp.
Jeffrey Mfg. Co.

Locomotives (Storage Battery)
General Electric Co.
Jeffrey Mfg. Co.

Classified Directory—*Continued*

Locomotives (Steam, Gas and Electric
Davenport-Besler Corp.
General Electric Co.

Log Washer
McLanahan & Stone Corp.
Smith Engineering Works

Lubricants
Gulf Refining
Texas Company

Lubricants (Wire Rope)
Broderick & Bascom Rope Co. (Yellow Strand)

Machinery Guards
Harrington & King Perf. Co.
W. S. Tyler Co.

Magnets
General Electric Co.

Magnetic Pulleys
Birdsboro Steel Foundry & Mach. Co.
C. G. Buchanan Co., Inc.

Manganese Steel (Plates and Sheets)
Manganese Steel Forge Co., Inc.

Manganese Steel Castings
Frog, Switch & Mfg. Co.
Pettibone Mulliken Corp.

Material Handling Equipment
Jeffrey Mfg. Co.

Mechanical Rubber Goods
B. F. Goodrich

Mill Liners and Linings (Iron for Ball and Tube Mills)
Babcock & Wilcox Co.
Carnegie-Illinois Steel Corp. (United States Steel Corp. Subsidiary)
Hardinge Company, Inc.
Jeffrey Mfg. Co.
F. L. Smidth & Co.
Traylor Engineering & Mfg. Co.

Mills, Grinding (Ball, Tube, etc.) (See also Crushers, Hammer)
Allis-Chalmers Mfg. Co.
American Pulverizer Co.
Gruendler Crusher & Pulv. Co.
Hardinge Co., Inc.
Raymond Pulverizer Division
F. L. Smidth & Co.
Williams Patent Crusher & Pulv. Co.

Mine Handling Equipment
Chain Belt Co.

Mixers (Commercial Concrete)
Jaeger Machine Co.

Mixers (Concrete)
Anchor Concrete Machy. Co.
Besser Mfg. Co.
Gruendler Crusher & Pulv. Co.
Jaeger Machine Co.
Koehring Co.

Molds (Concrete Pipe)
Quinn Wire & Iron Works

Mortar Colors
Geo. S. Mepham Corp.
Tamms Silica Co.

Motors and Generators (Electric Units)
Allis-Chalmers Mfg. Co.
General Electric Co.

Motor Trucks
Ford Motor Co.
Hug Co.

Multiple V-Belts (See Belting, V Type)

Nozzles (Gravel Washing)
Chain Belt Co.

Nuts (Lock)
Standard Pressed Steel Co.

Oil Burners
Babcock & Wilcox Co.
F. L. Smidth & Co.

Oil Forges
Gardner-Denver Co.

Oils (Lubricating)
Gulf Refining Co.
Texas Company

Packings (Pump, Valve, etc.)
B. F. Goodrich
Goodyear Tire & Rubber Co., Inc.

Paint (Asphalt)
Texas Company

Pallets
Anchor Concrete Machinery Co.
Besser Mfg. Co.
Commercial Shearing and Stamping Co.
Multiplex Concrete Machy Co.
Stearns Mfg. Co.

Pavers (Concrete)
Koehring Co.

Perforated Metal
Chicago Perforating Co.
Harrington & King Perf. Co.
Hendrick Mfg. Co.
Joseph T. Ryerson & Son, Inc.

Pipe Machines
Besser Mfg. Co.
Quinn Wire & Iron Works

Pipe Molds (Concrete)
Besser Mfg. Co.
Stearns Mfg. Co.

Plants (Crushing)
Traylor Engineering & Mfg. Co.

Plants (Sand and Gravel)
Traylor Engineering & Mfg. Co.

Plants (Stone Crushing)
Traylor Engineering & Mfg. Co.

Plates (Double Corrugated)
Hendrick Mfg. Co.

Pneumatic Drills (See Drills)

Poidometers
Schaffer Poidometer Co.

Portable Conveyors
Fuller Company
Geo. Haiss Mfg. Co., Inc.
Link-Belt Co.

Portable Crushing and Screening Unit
Pioneer Gravel Equipt. Mfg. Co.
Smith Engineering Works
Williams Patent Crusher & Pulv. Co.

Portable Loaders
Geo. Haiss Mfg. Co., Inc.
Jeffrey Mfg. Co.

Power Tampers
Besser Mfg. Co.

Power Transmission Equipment
Chain Belt Co.
Standard Pressed Steel Co.

Precipitators (Electrical)
Western Precipitation Co.

Pulleys, Magnetic (See Magnetic Pulleys)

Pulverizers
Allis-Chalmers Mfg. Co.

Pulverizers (See also Crushers, Mills, etc.)
Allis-Chalmers Mfg. Co.
American Pulverizer Co.
Babcock & Wilcox Co.
Dixie Machy. Mfg. Co.
Gruendler Crusher & Pulv. Co.
Hardinge Co., Inc.
Jeffrey Mfg. Co.
New Holland Machine Co.
Pennsylvania Crusher Co.
Raymond Pulverizer Division
F. L. Smidth & Co.
Sturtevant Mill Co.
Traylor Engineering & Mfg. Co.
Williams Patent Crusher & Pulv. Co.

Pumps (Air Lift)
Fuller Company

Classified Directory—*Continued*

Pumps (Cement)
Fuller Company

Pumps (Cement Slurry)
Allen-Sherman Hoff Co.
The Dorr Co.
Morris Machine Works
F. L. Smidth & Co.
A. R. Wilfley & Sons

Pumps (Centrifugal)
Allen Cone & Machy. Corp.
Allen-Sherman Hoff Co.
Allis-Chalmers Mfg. Co.
Hetherington & Berner, Inc.
Jaeger Machine Co.
Morris Machine Works
A. R. Wilfley & Sons

Pumps (Dredging)
Allen-Sherman Hoff Co.
Bucyrus-Erie Co.
Morris Machine Works

Pumps (Pulverized Coal)
Babcock & Wilcox Co.

Pumps (Sand and Gravel)
Allen-Sherman Hoff Co.
Allis-Chalmers Mfg. Co.
Hetherington & Berner, Inc.
Morris Machine Works
Pettibone Mulliken Corp.
A. R. Wilfley & Sons

Racks or Decks for Lift Trucks
Besser Mfg. Co.

Railways (Electric)
General Electric Co.

Railway Equipment
General Electric Co.

Ready Mixed Concrete Plants
Blaw-Knox Co.
Jaeger Machine Co.

Ready Mixed Concrete (Truck Mixer Bodies)
Blaw-Knox Co.
Jaeger Machine Co.

Reciprocator Feeder for Unloading Hopper Bottom Cars
Besser Mfg. Co.

Recovery Plants (Dust)
W. W. Sly Mfg. Co.

Road Machinery
Blaw-Knox Co.
Harnischfeger Co.
Koehring Co.
Marion Steam Shovel Co.
Northwest Engineering Co.

Rock Bits (See Drill Bits)

Rock Drills (See Drills, Rock)

Rod Mills
Hardinge Co., Inc.

Roller Bearings
Timken Roller Bearing Co.

Roofing (Ready to Lay)
Texas Company

Rope, Wire (See Wire Rope)

Rotary Screens (Sections and Segments)
Hendrick Mfg. Co.

Sack Balers
Besser Mfg. Co.

Sandblast Equipment
W. W. Sly Mfg. Co.

Sand Drag
Smith Engineering Works

Sand Settling Tanks
Allen Cone & Machy. Corp.
Jeffrey Mfg. Co.
Link-Belt Co.
Nordberg Manufacturing Co.
Smith Engineering Works

Scrapers (Power Drag)
Blaw-Knox Co.
Bucyrus-Erie Co.
Link-Belt Co.
Northwest Engineering Co.
Sauerman Bros., Inc.

Scraping Hoists
Gardner-Denver Co

Screens
Allis-Chalmers Mfg. Co.
Earle C. Bacon, Inc.
Bartlett & Snow Co.
Besser Mfg. Co.
Carnegie-Illinois Steel Corp. (United States Steel Corp. Subsidiary)
Chicago Perforating Co.
Cleveland Wire Cloth & Mfg. Co.
Hardinge Co., Inc.
Harrington & King Perf. Co.
Hendrick Mfg. Co.
Industrial Brownhoist Corp.
Jeffrey Mfg. Co.
Link-Belt Co.
Ludlow-Saylor Wire Co.
New Holland Machine Co.
Nordberg Mfg. Co
Pioneer Gravel Equipt. Mfg. Co.
Productive Equipment Corp.
Robins Conveying Belt Co.
Roebling's, John A., Sons Co.
Ross Screen & Feeder Co.
Simplicity Engineering Co.
Smith Engineering Works
Sturtevant Mill Co.
Universal Vib. Screen Co.
Williams Patent Crusher & Pulv. Co.

Screens (Revolving)
Geo. Haiss Mfg. Co., Inc.

Screens, Scalping (Hercules and Standard)
Smith Engineering Works
Williams Patent Crusher & Pulv. Co.

Screens (Perforated
Hendrick Mfg. Co.

Screens (Testing)
Hendrick Mfg. Co.

Screens (Vibrating)
Allen Cone & Machy. Corp.
Allis-Chalmers Mfg. Co.
Jeffrey Mfg. Co.
Link-Belt Co.
Nordberg Mfg. Co
Robins Conveying Belt Co.
Simplicity Engineering Co.
Smith Engineering Works
Sturtevant Mill Co.
W. S. Tyler Co.
Universal Vib. Screen Co.
Williams Patent Crusher & Pulv. Co.

Screens, Washing (Hercules, Ajax and Standard)
Smith Engineering Works

Screw Conveyors
Besser Mfg. Co.

Screw Rewasher (Single and Twin)
Smith Engineering Works

Screws (Cap, Self Locking, Set, Hollow Set)
Standard Pressed Steel Co.

Scrubbers, Washers
Allis-Chalmers Mfg. Co.
Earle C. Bacon, Inc.
Hardinge Company, Inc.
Lewistown Fdy. & Mach. Co.
Smith Engineering Works
Traylor Engineering & Mfg. Co.

Separators (Magnetic)
Birdsboro Steel Foundry & Mach. Co.
C. G. Buchanan Co., Inc.

Separators (Slurry)
F. L. Smidth & Co.

Seal Rings (Kilns, Coolers and Dryers)

Shovels, Power (Steam, Gas, Electric, Diesel, Oil)
Bucyrus-Erie Co.
Harnischfeger Corp.
Industrial Brownhoist Corp.
Koehring Co.
Link-Belt Co.
Marion Steam Shovel Co.
Michigan Power Shovel Co.
Northwest Engineering Co. (Crawling Tractor)

Silos
F. L. Smidth & Co.

Classified Directory — *Continued*

Skip Hoists and Skips
Link-Belt Co.

Slings (Wire Rope)
American Cable Co., Inc.
Bethlehem Steel Co.
Broderick & Mascom Rope Co. (Yellow Strand)
A. Leschen & Sons Rope Co
Roebling's, John A., Sons Co.

Special Aggregates
Tamms Silica Co.

Speed Reducers
Link-Belt Co.

Sprockets and Chain
Chain Belt Co.

Standpipes
Ross Screen & Feeder Co.

Steel, Abrasion Resisting
Joseph T. Ryerson & Son, Inc.

Steel Bars
Timken Roller Bearing Co.

Steel (Electric Furnace)
Chicago Steel Foundry Co.
Timken Roller Bearing Co.

Steel (Open Hearth)
Timken Roller Bearing Co.

Steel (Special Alloy)
Timken Roller Bearing Co.

Steel (Special Analysis)
Timken Roller Bearing Co.

Steels, Drill (See Drill Steel)

Stokers
Babcock & Wilcox Co.
Combustion Engineering Corp

Strippers
Besser Mfg. Co.

Stucco Materials
Geo. S. Mepham Corp.

Tampers (Automatic)
Multiplex Concrete Machy Co.

Tanks
Allen Cone & Machy. Corp.
Combustion Engineering Corp.
The Dorr Co.
Hendrick Mfg. Co.
Jeffrey Mfg. Co.
Link-Belt Co.

Thickeners
The Dorr Co.
Hardinge Co., Inc.

Tile Machines (Drain)
Besser Mfg. Co.

Tires and Tubes
B. F. Goodrich Co.

Track Equipment
Carnegie-Illinois Steel Corp. (United States Steel Corp. Subsidiary)
Nordberg Mfg. Co.

Track Shifters
Nordberg Mfg. Co.

Tractors
Koehring Co.

Tramways (Aerial Wire Rope)
Bethlehem Steel Co.
Broderick & Bascom Rope Co. (Yellow Strand)
A. Leschen & Sons Rope Co.
Roebling's, John A., Sons Co.

Transmission Belting (See Belting)

Transmission Machinery
Allis-Chalmers Mfg. Co.
Timken Roller Bearing Co.

Truck Bodies (Ready Mixed Concrete)
Blaw-Knox Co.
Chain Belt Co.
Jaeger Machine Co.

Trucks (Mixers)
Blaw-Knox Co.
Chain Belt Co.
Jaeger Machine Co.

Trucks and Trailers (See Motor Trucks)

Tube Mills (See Mills, Ball, Tube, etc.)

Tube Mill Liners (See Mill Liners)

Tubing (Blasting)
B. F. Goodrich Co.

Tubing (Seamless Steel)
Timken Roller Bearing Co.

Underground Shovels
Nordberg Mfg. Co.

Valves (Pump)
B. F. Goodrich Co.

Vibrating Screens (See Screens, Vibrating)

Vibrators
W. S. Tyler Co.

Washers (Sand, Gravel and Stone)
Allen Cone & Machy. Co.
Allis-Chalmers Mfg. Co.
The Dorr Co.
Eagle Iron Works
Gruendler Crusher & Pulv. Co
Hardinge Copmany, Inc.
Jeffrey Mfg. Co.
Link-Belt Co.
Traylor Engr. & Mfg. Co.

Waste Heat Boilers
Combustion Engineering Corp.

Waterproofing
Tamms Silica Co.

Weighing Equipment
Schaffer Poidometer Co.

Weigh-Mix
Koehring Co.

Welding and Cutting Apparatus
General Electric Co.

Welding Wire
Roebling's, John A., Sons Co.

Wire Cloth
Cleveland Wire Cloth & Mfg. Co.
Ludlow-Saylor Wire Co. Inc.
Roebling's, John A., Sons Co.

Wire Rope
American Cable Co., Inc.
Bethlehem Steel Co.
Broderick & Bascom Rope Co. (Yellow Strand)
A. Leschen & Sons Rope Co.
Roebling's, John A., Sons Co.

Wire Rope Fittings
American Cable Co.
Bethlehem Steel Co.
Broderick & Bascom Rope Co. (Yellow Strand)
A. Leschen & Sons Rope Co.
Roebling's, John A., Sons Co.

Wire Rope Slings (See Slings, Wire Rope)

Wrenches (Car)
Appleton-Atlas Car Mover Corp.

CLASSIFIED ADVERTISEMENTS

POSITIONS WANTED — POSITIONS VACANT
Set in six-point type. Minimum $1.00 each insertion, payable in advance.

INFORMATION
Box numbers in care of our office. An advertising inch is measured vertically in one column. Three columns, 30 inches to the page.

CLASSIFIED—Displayed or undisplayed. Rate per column inch, $5.00. Unless on contract basis, advertisements must be paid for in advance of insertion.

USED EQUIPMENT FOR SALE

CONSOLIDATED GOOD USED EQUIPMENT

1—24"x36" Bacon-Farrel Jaw Crusher.
1—24"x36" Allis Chalmers Jaw Crusher.
8—Jaw Crushers: 4x10", 10x7" Farrel; 6x24", 7x24" Sturtevant reduction; 9x15" Champion—other sizes & types.

5—Ruggles Coles Class "A" Direct Heat Rotary Dryers: 5x26', 5x30', 80"x40', 70"x45', 8'8"x85'.
12—Direct Heat Rotary Dryers: 3x30', 4x30', 5x30', 5x60', 6x40', 6x50', 6x60', 8x60'.
7—Rotary Kilns: 5x30', 6x60', 7x100', 8x110', 8x125', 9'6"x150'.

1—4x8' Allis Chalmers Vib. Screen, 2-deck.
3—3x6' Niagara Screens, 2-deck.
1—24" Stone Elevator, chain, 70' c/c.
8—Tyler Hummer Screens—3x5', 4x5', 4x7', Types 31, 33, 37, 39, 60.
2—Tyler V-32 Vibrators, Mag. units only.
4—Single Roll Crushers: 18x16" Penna., 18x18" Jeffrey, 18x24" McLanahan, 24x24" Link Belt.
10—Crushing Rolls: 20x14" Sturtevant; 24x14", 36x16" "B" Allis Chalmers; and larger.

3—24" No. 4 Mikro Pulverizers, each triple screw feed and stirrup hammers for fine pulverizing of clays, etc.

2—10' Sturtevant Air Separators.
1—5 Roll Raymond High Side Mill.
3—4 and 5 roll Raymond Low Side Mills.
5—Raymond Pulverizers: Nos. 0000, 00, 1, 3.
7—Raymond Imp Mills: Nos. 3, 32, 45, 50, 55.
7—Hardinge iron lined Ball Mills: 3'x8", 4½'x16", 6'x16", 6'x22", 8'x22", 8'x30".
1—No. 32 Marcy Ball Mill.
1—3'x12' Hendy iron lined Tube Mill.
1—5'x22' Bonnot iron lined Tube Mill.

Just a partial list
WE WILL BUY A SINGLE MACHINE OR COMPLETE PLANT
What do you wish to sell? Send us details.

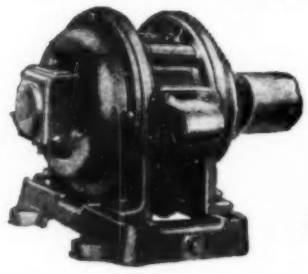
CONSOLIDATED PRODUCTS COMPANY, INC.
15-16-17 Park Row **New York, N. Y.**
Plant and Shops at Newark, N. J., cover 8 acres of ground.

GREGORY "HI-GRADE-REBUILT" Electric Motor and Machy. Bargains

For Reliability and Economy

● MONEY BACK GUARANTEE ●

A C MOTORS
D C MOTORS
MOTOR-GENERATOR SETS
ARC WELDERS



METERS
TRANSFORMERS
AIR COMPRESSORS
CENTRIFUGAL PUMPS

SAVE MONEY Send Us Your Inquiries Write—Phone—Wire

GREGORY ELECTRIC CO. (Est. 1893)
1601-A SO. WOLCOTT AVE. CHICAGO
(formerly Lincoln St.)

1—60x16 Bartlett & Snow Washing Screen.
1—48x16 Bartlett & Snow Washing Screen.
1—Traylor No. 5 Crusher.
1—Allis Chalmers No. 4 Reduction Crusher.
1—10" all electric suction dredge.
1—Bartlett & Snow 8kip Hoist, 2 Cars, 82 H. P.
1—Lot concrete pipe forms, 12" to 72".
1—5 Ton Overhead crane, with track, all electric.

A. J. CLEMENTZ'S SONS
233 First Street, S. W. Massillon, Ohio

PRICED RIGHT FOR QUICK SALE

2—6'x60' Bonnot Rotary Kilns.
1—6'x50' Ruggles-Cole Rotary Dryer with Link Belt reduction unit and motor drive.
2—3'x35' Bonnot Rotary Coolers or Dryers.
1—4½'x35' Rotary Dryer.
1—Gruendler 18x24" double roll Crusher.
3—Raymond Mills No. 3, No. 1, No. 00, No. 0000.
1—6'x6' Abbe Pebble Mill.
4—Link-Belt 60" Dehydrating Cones.
2—Plymouth 3 ton, 36" gauge Gasoline Locomotives.
1—Ingersoll-Rand Portable Gasoline Air Compressor, 120 CFM.
1—Link-Belt 3x8' Vibrating Screen.

Partial List—Send for Details

BRILL EQUIPMENT CORPORATION
183 Varick Street, New York, N. Y.
907 Mart Bldg., St. Louis, Mo.

SPECIAL!
200 ALL-STEEL 50-TON BATTLESHIP HOPPER CARS

25—40 ton steel u/f flats.
20—50 ton steel u/f flats.
50—30 ton steel u/f flats.
200—30 ton steel u/f box cars.
75—30 ton steel u/f stock cars.
75—50 ton all-steel gons.

Narrow Gauge Dump Cars and Locomotives
Standard Gauge Dump Cars and Switch Engines

Locomotive Cranes
1—15-20 ton Link-Belt, 50 ft. boom.
1—20 ton Browning No. 8, 50 ft. boom.
1—30 ton Ohio, 50 ft. boom.
1—40 ton Brownhoist, 50 ft. boom.

Saddle Tank Locomotives
1—32 ton American, Std. Ga.
1—40 ton Baldwin, Std. Ga.
1—40 ton geared Heisler, Std. Ga.
4—50 ton 6-wheel tender type engines, ICC condition.

RAILS

Complete Stocks Carried at Principal Points Throughout the Country

HYMAN-MICHAELS COMPANY
122 SO. MICHIGAN AVE. CHICAGO, ILL.
ST. LOUIS ● NEW YORK ● SAN FRANCISCO ● SEATTLE

UNUSUAL BARGAINS

⅜, ½, ⅝, ¾ and 1 yd. Gasoline and Steam Shovels.
3, 3½, 5 and 8 yd. Electric Shovels.
2, 4, 4½, 5 and 6 yd. Monighan and Bucyrus Draglines.
Steam, Gasoline and Belted Hoists.
20 and 30 ton std. ga. Locomotive Cranes.
Jaw Crushers 8x12" to 66x84".
Roll Crushers 12x32" to 16x42", 2 and 5½" Symons Cone.
Rotary Dryers 3'x30', 5'x35', 6x50' and others.
20 ton American Guy Derricks, also stiff leg derricks.
36" ga. Steam Locomotives, 9-32 tons.
Std. ga. Steam Locomotives 25-75 tons.
Gasoline Locomotives 3-25 tons, various gauges.
Clamshell Buckets, ½, ⅝, ¾, 1, 1¼, 1½ and 2 yd.
Page Dragline Buckets, ⅝, 1, 1½, 1¾ and 2 yd.
100 HP Fairbanks Morse Y-V Diesel Engine.
Special—125 HP Venn Severin Diesel, Rebuilt.
Others up to 750 HP with and without generators.
Natural Gas and Steam Engines.
Let me have your inquiries, also list of surplus items.
Ask for Bulletin No. 39.

MID-CONTINENT EQUIPMENT CO.
710 Eastgate Pa. 2290 St. Louis, Mo.

"E. C. A. Rebuilt" Quarry and Gravel Plant Equipment

AIR COMPRESSORS

Portable and stationery, belt with elec. or gas power, sizes from 21 cu. ft. to 1,000 cu. ft.

BUCKETS

1—4 yd. Hayward Class "G" clamshell.
24—Williams, Blaw Knox, Owen clamshell buckets, all sizes & Types.
4—Dragline buckets: 1—Northwest 1⅝ yd.; 2—Page 1½ yd.; 1—Blaw Knox 1 yd.

CARS

Large lot including std. ga. 6 and 12 yd. and 20 yd., 36 in. ga. 5 yd. and 24 ga. 1½ yd.

CENTRAL MIXING PLANT

1—Central mixing plant consisting of 40-S 1½ yd. Smith tilting mixer, 225-ton Blaw Knox 3-compartment steel bin with 3-beam scale; 1—1200 bbl. Blaw Knox round cement bin with weigh batcher & bucket elevators.

CRANES AND DRAGLINES

1—Link Belt K-55, ser. No. 1654, crawler mounted gas crane; 70′ boom and 2 yd. bucket.
2—Northwest Model 104, Ser. Nos. 2679 & 1597, 45′ boom, 1¼ yd. bucket.
1—Northwest Model 105 ser. No. 2653, 40′ boom, 1 yd. bucket.

SPECIAL ——Wiley model 75 Whirley with 75′ boom, fully revolving with 80 HP, 3-D elec. hoist & 30 HP swinger, 20 ton cap.

1—Link Belt Model K-1 crane, shop No. 1024, 50′ boom, 1 yd. bucket.
1—Osgood heavy duty dragline ser. No. 2069, 40′ boom, ⅝ yd. bucket.
1—Industrial Brownhoist No. 1, ser. No. 10057, 35′ boom, ½ yd. bucket.
1—Byers Bearcat model 26 ser. No. 7299, 30′ boom, ½ yd bucket.
1—Erie type B-2, ser. No. 4241 steam crane, 40′ boom, 1 yd. bucket.

CRUSHERS

1—Symons size 5½ coarse cone type No. 521.
1—Allis Chalmers size No. 6, style N; openings 12 x 44 in.
2—McCully No. 3 gyratory crushers.
1—48"x60" Allis Chalmers Superior jaw crusher.
1—Climax No. 2½ jaw crusher, 10x20 in. No. 2637.
1—Telsmith No. 9A jaw crusher, ser. No. 4139, 9x16 in.
1—Allis Chalmers smooth type crushing rolls, size 42x16 in.

DERRICKS

4—All steel stiff leg derricks: 1—15 ton Dobbie, 80′ boom; 1—15 ton Clyde, 50′ boom; 1—15 ton Clyde "A" frame barge derrick, 50′ boom; 1—10 ton Insley, 80′ boom.
5—Steel guy derricks: 4—6-ton Bedford, 80′ boom; 1—10-ton American, 100′ boom.

DRILLS

6—Wagon drills, Ingersoll Rand & Gardner Denver, with IRX71 & GD17 and 21 drills.

LOADERS

2—Barber Greene: 1—Model 42-A, No. 23431; 1—Model 42-B, No. 42-12-58.
1—Haiss No. C-7041.

LOCOMOTIVES

6—Elec. storage battery type, 4 ton, 24" ga. with battery boxes: 4—Whitcomb; 2—Atlas.
22—Gas locomotives: 6—8 ton Vulcan, std. Ga.; 2—7 & 8 ton Whitcomb, 36" ga.; 3—4 ton Vulcan & Davenport, gear drive, 36" ga.; 1—4 ton Plymouth friction drive, 36" ga.; 7—7 ton Whitcomb & Plymouth, gear drive, 24" ga.; 3—Plymouth 4 ton, 24" ga.

PUMPS

5—Dredge pumps: 1—10" Morris manganese; 1—8" Cataract No. 175895; 1—8" Morris; 1—6" Erie; 1—6" Fairbanks Morse Woods trash pump.

TRACTORS

3—Allis-Chalmers Model "L" Tractors, Nos. 682, 1670 & 1691, with Baker hydraulic Bull Dozers.
2—Caterpillars: 1—Model 60, PA5842, 1—Model 65.

SEND FOR NEW STOCK LIST

EQUIPMENT CORPORATION OF AMERICA

PHILADELPHIA — P. O. Box 5471, Kingessing Sta. — Phone Granite 7800
CHICAGO — 1119 S. Washtenaw Ave. — Phone Nevada 2400
PITTSBURGH — P. O. Box 983 — Phone Federal 2000

New—RAILS—Relaying

ALL SECTIONS

Also contractors' equipment, "V" shaped and Western cars, 24 and 36-in. gauge, portable track, gas locos, frogs and switches. Attractive prices quoted, wire, write or telephone for quotations.

M. K. FRANK

480 Lexington Ave., New York, N. Y. — 25 St. Nicholas Building, Pittsburgh, Pennsylvania

---

2 BARGAINS

¾ yd. Erie Type B Shovels Ready for Work.

W. H. ANDERSON CO., Inc.

47 W. Seven Mile Road, DETROIT, MICH.

BOILER: 40 HP. Locomotive type, New, 190 lbs. pressure.

BUCKETS: Hayward 3 yd. capacity, Orange Peel, Blaw Knox 3yd. and 2 yd., Clam Shell.

CARS: 10—Western 10 yd., 36" gauge, all steel, air dump, air brakes.

COMPRESSOR: Ingersoll Rand Multi-cylinder, 2 stage, air cooled, 284 ft. with 50 H.P. A.C. motor direct coupled.

LOCOMOTIVE CRANE—Steam: 15 ton Industrial, steam, standard gauge, double drums, 50 ft. boom.

CRANE & SHOVELS—CRAWLER TREAD—ELECTRIC: 1—10 tons, 40 ft. boom. 1—23 tons, 60 or 70 ft. boom. 1—1 yd. capacity Electric Shovel with ⅞ yd. rock dipper, with or without 40 ft. crane boom. 1—2 yd. capacity Electric Shovel, 100 H.P. M.G. set, Independent motor for hoist, swing and crowd, with or without 70 ft. crane boom.

DRILL SHARPENER: Ingersoll Rand DW type for 6" and 7" well drill bits.

DREDGE: 1—6" Portable, all steel, gasoline engine driven Dredge with ladder cutter, spuds, 5 drum hoist, etc., thoroughly modern, in new condition.

JAW CRUSHERS: With openings 6x36" up to 48x60".

GYRATORY CRUSHERS: All sizes and types for secondary crushing.

PORTABLE CRUSHING PLANT: 1—Telsmith 10-A portable, all steel, Gyratory Crusher, with elevator, screens, etc.

AIR RECEIVER: 42" dia. x 8'6" wide.

PAN FEEDER: Stephens-Adamson, heavy duty type, 42" wide, 40' centers, complete with clutch, etc., excellent condition, cheap.

ROLL CRUSHER: 16x42", heavy duty type.

A. J. O'NEILL

Lansdowne Theatre Bldg., Lansdowne, Pa.
Phones: Madison 7578-7579

FOR SALE

1—P & H 400 ¾ yd. Rebuilt gasoline comb. shovel and crane.
1—Byers 80 ¾ yd. gasoline crane New 1936.
1—Byers 125—1½ yd. gasoline Dragline New 1936.
1—Marion Electric Dragline Model 37, 50′ boom, 1½ yd. bucket, excellent condition.
1—Marion 36 Steam shovel extra length boom and dipper sticks.
1—Marion 31 Steam comb. shovel and crane.
1—37 Kennedy Van Saun gyratory crusher with V belt drive and motor.
1—8 inch McCulley gyratory crusher.
1—No. 3 Austin gyratory crusher.
1—Three Drum American Hoist.
1—8x20 Wheeling jaw crusher.
1—18x24 Crushing rolls.
1—Sauerman Slackline Elec. Hoist with 150 hp. motor.
1—12 inch Amsco dredge pump 250 hp. motor direct connected.
1—Set Link Belt dredging elevator—2-30 inch continuous buckets 36 ft. centers with extra parts for longer centers.
1—Orange peel bucket.
1—Dorr washer with sand drags.
1—Air compressor.
1—65 ft. steel ladder for dredge boat.
1—60 ft. steel spud for dredge boat.
1—Rachet type Elec. spud hoist.
6—Transformers and various motors.

Elwood Sales and Manufacturing Co.

LAFAYETTE, INDIANA

PORTABLE CRUSHING PLANT

Cedar Rapids portable outfit—9x16 crusher; 32"x12' revolving screen; 25' elevator. Priced at $1500. No power. F.O.B. cars Central Penna. Also one 36"x22' rotary screen, 4 sections, including scrubber—$500.

RENTAL SERVICE CO., INC.

2017 W. Venango Street, Philadelphia, Pa.

FOR SALE

Drag Scraper Hoists, 2 cu. yd. and 1 cu. yd., slightly used.

BEAUMONT BIRCH CO.

Philadelphia, Pa.

About January 1, 1938, we shall have for sale at a low figure four 42-inch Fuller mills with vertical motors, 75 h.p., 3 phase, 60 cycle, 440 volts. May be seen operating.

Kosmos Portland Cement Co.

Kosmosdale, Jefferson County, Ky.

3—Bridge Cranes, bucket operating, elec., AC. & DC. Electric Cat. Shovels—Cranes—Drags—⅜ to 8 yds. Monighan Diesel Walker Draglines—2W, 3W, & 4W, 1¼ & 1 yd. Comb. Shovels, Cranes & Draglines. ⅜ yd. Crane—Drag., full revolving. Also shovel. Gas Locomotives—24" to Std. gauge, 4 to 30 tons. Belt Conveyors—Abt. 1000′ of 24". Roller Bearing. Diesel Generator Unit—125 KW. DC., also motors. Buckets—Clam., Drag., Scraper, Slackline, ½ to 8 yds. Shovel & Trench Hoe Attachments, ½ yd. & larger.

James Wood, 53 W. Jackson Blvd., Chicago

ELECTRICAL MACHINERY

Motors and Generators, A.C. and D.C., for sale at attractive prices. New and Rebuilt. All fully guaranteed. Write for List and Prices.

V. M. NUSSBAUM & CO.,
Fort Wayne, Indiana

3—25/30 Yard LeTourneau Buggies.
3—No. 60 Caterpillar Gasoline Tractors.
1—No. 75 Caterpillar Diesel Tractor.
2—LaPlante-Choate 10 yd. Crawler Wagons.
25 & 30 ton Plymouth Gasoline Locomotives.
Diesel Engines, 25, 30, 100, 150, 200 to 800 HP.
Crushers—Compressors—Cranes—Shovels—Draglines.

Mississippi Valley Equipment Co.

515 LOCUST ST. — ST. LOUIS, MO.

"Try us whenever Buying or Selling"

Good Equipment—Priced Right

1—Butler batcher plant 150 yds., 3 compts., weigh batchers, cement bin, conveyors, elevators, complete.
1—Butler batcher plant 125 yds., combined material-cement bin, weigh batchers, conveyors, elevators, complete.
1—Butler 2 compartments 220 yds. steel bin.
1—Blaw Knox 72 ton two compt. steel bin.
5—Jaeger 5 yards separate engine driven truck mixers.
1—Fuller-Kinyon portable self propelled bulk cement unloader.
2—Fuller cement bins, 155 bbl. cap., with automatic batchers.
1—Osgood steam shovel, heavy duty, 1¼ yds. cap.
1—Brownhoist gas crane, 10 ton cap.
1—American 40 ton, std. ga., saddle tank loco.
1—Truck crane, Browning, very fine.
1—Loco. Whitcomb, 20 tons, 36" gauge, gas.
1—Loco. Vulcan, 20 tons, 36" gauge, gas.
1—Loco. Whitcomb, 14 tons, 36" gauge, gas.
1—Loco. Vulcan, 4½ tons, 36" gauge, gas.
1—Sand pump, 8", cent. Gould.
1—Elevator, buckets 8"x6"x12", centers 32'.
1—Sauerman gas hoist dbl. drums, 50 h.p.
1—AMSCO 8" dredge pump, 150 HP, AC elec. drive.
1—Locomotive crane, Ohio 25 tons, 60′ boom.
Jaw crushers, 7x12, 9x15, 11x26, 24x36. Many others.
1—Clyde 3 drum, with swinger, electric hoist 75 h.p.
1—Derrick, steel stiff leg, 80′ boom, cap. 10 tons.
4—Guy derricks, booms up to 100′ 7½ to 10 tons cap.
1—Barnes cent. pump, 8" gas driven.
1—Lawrence cent. pump, 8" gas driven.

RICHARD P. WALSH CO.

30 Church St., New York City.

CLASSIFIED ADVERTISEMENTS—*Used Equipment for Sale*

FOR SALE

FIVE SWITCHING LOCOMOTIVES AS ABOVE

Ready for Immediate delivery—Attractive price for quick sale

Quotations on Request

RAILWAY ACCESSORIES COMPANY, Times Star Tower, Cincinnati, Ohio

LOCOMOTIVES

14 Ton Porter 36" gauge, four wheel saddle tank locomotive, 9x14" cylinders, built 1923.

21 Ton Vulcan 36" gauge, four wheel saddle tank locomotive, 11x16" cylinders, built 1923, National Board Boiler.

30 Ton Vulcan, 36" gauge four wheel saddle tank locomotive, 13x18" cylinders, built 1922, A.S.M.E. boiler.

50 Ton American four wheel saddle tank locomotive, 16x24" cylinders, A.S.M.E. boiler.

53 Ton Baldwin six wheel switching locomotive with separate tender, 18x24" cylinders, A.S.M.E. boiler.

50 Ton Baldwin six wheel switching locomotive with separate tender, 17x24" cylinders, A.S.M.E. boiler.

30 Ton Plymouth four wheel gasoline locomotive.

25 Ton Plymouth four wheel gasoline locomotive.

BIRMINGHAM RAIL & LOCOMOTIVE COMPANY

Birmingham, Alabama

JAW CRUSHERS

10x8, 12x7½, 14x7, 15x9, 15x10, 16x9, 16x12, 16x10, 18x11, 20x8, 20x6, 20x10, 20x12, 20x11, 26x12, 30x15, 30x13, 36x30, 36x18, 36x14, 36x9, 36x6, 38x18, 36x10, 36x24, 42x9, 48x36, 60x42 and 84x66.

CONE & GYRATORY CRUSHERS

18 in., 24 in., 30 in., and 36 in. Symons Disc.
4-10 TZ Traylor 4 ft. Gyratory.
4—Nos. 5, 3 & 6 Austin Gyratory.
2—Traylor T-12 Bulldog Gyratory.
No. 6 BH Traylor Fine Reduction.
17 Gates K—Nos. 3, 4, 5, 6, 7½, 8 & 9½.

CLAM SHELL BUCKETS

¾ yd. cap. Williams Hercules Digger.
¾ yd cap. Hayward Material Handling.
6 Blaw-Knox & Owen 1 to 2 yd. cap.

CONVEYOR BELT & PARTS

1400 ft. New & Used 20" 7 ply.
Idlers & Drives for 18, 24, 30 & 36".

MISCELLANEOUS

Air Compressors: 310, 528, 676 & 1300 ft.
Gas Locomotives: (13) from 3 to 16 tons.
Derricks: (8) Stiff Leg & Guy Type.
Sauerman Outfits: ½ yd., 1 yd., & 1½ yd.
9x16 Portable Crushing Plant with Bin.
Rotary Dryers: 8'0"x84 ft., 6'0"x50 ft., 5'8"x60 ft., 4'0"x30 ft., 3'6"x24 ft., 3'0"x20 ft.
125 ton Fairbanks R.R. Scale—50 ft.
5'x12' Rod Mill & 30" Griffin Mill.
8'x6' KVS & 5'x22" Hardinge Ball Mill.

R. C. STANHOPE, INC.

875 Sixth Ave. New York, N. Y.

FOR SALE

2—Type A Jeffrey Hammer Mills, 24"x18".
1—Type B Jeffrey Hammer Mill, 24"x36".
1—Deane Jet Steam Condenser, No. 57340, Size 12"x22"x24".
2—Deane Steam Pumps, 7½"x8½"x6", Serial Nos. 81900 and 82325.
1—42" Fuller-Lehigh Mill, Shop No. 2123.
1—6x60 Cooler or Dryer, with channel flights.
2—No. 66 Smidth Kominuters.
1—4x8 Traylor large size Sheridan Shaking Grizzley; never used.
1—Fay & Egan Band Saw No. 192.
2—Open end Bag Packing machines, three-bag and four-bag capacities.
250 pulleys of various sizes and types for sale at bargain prices; diameter 6" to 128".

All equipment located at Hartshorne, Oklahoma; for further details write P. O. Box 3046, Houston, Texas.

HOLT 5-TON TRACTOR PARTS

Large assortment of genuine new HOLT parts. Will sell separately or take bids on the 'lot'. Write for list of parts and prices. Send us your inquiries on new and used equipment of all kinds; rentals, sales, service and parts.

SERVICE SUPPLY CORP.

2017 Venango Street, Philadelphia, Pa.

RAILS "1 Ton or 1000"

NEW RAILS—5000 tons—All Sections—All Sizes.
RELAYING RAILS—25,000 tons—All Sections—All Sizes, practically as good as New.
ACCESSORIES—Every Track Accessory carried in stock—Angle and Splice Bars, Bolts, Nuts, Frogs, Switches, Tie Plates.
Buy from One Source—Save Time and Money. 'Phone, Write or Wire.

L. B. FOSTER COMPANY, Inc.

PITTSBURGH NEW YORK CHICAGO

Electric Pumps: 1000g50', 500g300', 250g150' 325g105', 150g150', 100g105', 300g35'.
Horizontal steam engine, 12x12, center crank.
Belt conveyor 30" wide, 275' center, with belt.
Belt conveyors: 14"x17', 16"x64 & 75', 36"x150'.
Robins Automatic Trippers for 14" and 30" belt.
Portable flat belt conveyor, 2 hp electric, 16"x25'.
Hahs Digging Loader on wheels 16" buckets.
Link Belt Encased Bucket Elevator, 10"x35'.
Jeffrey Inclined Continuous bucket elevator, 14"x46'.
Universal 3'x8' single deck vibrating screen.
Link Belt 4'x8' single deck vibrating screen.
Sturtevant 4'x5' enclosed double deck vibrating screen.
Selectro 3'x8' triple deck vibrating screen.
Hummer 3'x5' & 4'x5' vibrating screens.
Hummer heavy duty 8'x7' 1 deck vibr. screen.
Revolving 3'x16' gravel screen.
Mundy two drum 15 hp hoist, gas or electric.
Ldg. 1 drum reversible 7½ hp electric hoist.
24" gauge track, loose rails, switches, cars.
Shovel front for Northwest No. 105.
Northwest 1 yard shovel on cats.

G. A. UNVERZAGT

15 PARK ROW, NEW YORK CITY

Jaw Crushers—4"x8" up to 66"x84".
Crushing Rolls—16"x10" up to 54"x24"—Gyratory Crushers—No. 3 up to 42".
Ring Roll Mills — No. 1½ and No. 1 — Swing Hammer Mills.
Rotary Fine Crushers—No. 1, No. 0, No. 00.
Direct Heat Rotary Dryers—4'x30', 5'x50', 5½'x35', 6'x60', 3½'x25', 8'x50'.
Semi-Indirect Heat Dryers, 4'x30', 4½'x26', 5'x30' and 8½'x75'.
Cement Kilns—3' up to 9½' diameter.
Hardinge—Marcy & Fuller—Lehigh Mills.
Raymond Mills—No. 00, No. 0, No. 5 roll.
1—New 60x84 Jaw Crusher.
Tube—Rod and Ball Mills—4' to 6' diameter.
1—4'x4' Ball Mill, continuous type.
5' & 30" air separators—Vibrating screens.
2—No. 7 Kent ring roll mills.
New rotary dryers made for all purposes.

W. P. HEINEKEN

95 Liberty St., N. Y. Tel.: Barclay 7-7298

FOR SALE

One McMyler Interstate Whirley Crane, boom radius approximately 60 feet, grab type bucket, ¾ ton capacity, with one spare bucket. Driven by G.E. DC variable speed motor for 220 volt operation. For immediate disposal. Write at once.

Boston Woven Hose & Rubber Co.

29 Hampshire St., Cambridge, Mass.

BARGAIN OFFERINGS

1—6½ YD. ELECTRIC STRIPPING SHOVEL, Bucyrus 320-B.
1—1 yd. Koehring Gas Crawler Crane.
1—Monighan Steam Dragline.
1—30 ton Std. Ga. Whitcomb Gas Loco.
2—21 ton PORTER LOCOMOTIVES, 36" ga.
36—Western 5 ton Dump Cars, 36" ga.
4—Western 12 yd. Dump Cars, Std. ga.
1—10" Amsco Dredging Pump.
4—Manistee Turbo Pumps, 1000 gal.
1—Bridge, Truss type, 2 spans 101' ea.
COMPRESSORS, PUMPS, BUCKETS, ETC.

IRON & STEEL PRODUCTS, INC.

Chicago (Hegewisch Sta.), Ill.

"Anything containing IRON or STEEL"

FOR SALE

1—No. 9 Telsmith Gyratory Crusher.
No. 4 Williams JUMBO Crusher.
Jaw Crushers—10½x20, and 10x18.
Gyratory Crushers—8 in. and 13 in. McCulley.
2—354 ft. I. R. Diesel Air Compressors.
3—528 ft. Chi. Pneum. Belted Air Compressors.
20—Centrifugal Water Pumps, 3 to 12 inch.
7—Clamshell Buckets, ½, ¾ and 1¼ yd. cap.
2—Owens 3 to 5 ton Stone Grapples.
4—Boilers, 100 and 125 H.P. A.S.M.E., 125 lb. pressure.
4—10x12 Mundy 3 drum steam hoists, with Mass. Std. Boilers.
150 H.P. Hall-Scott 6 cyl. 5x7 Gas Engine.
2—3 ton Vulcan 24 gauge Gas Locomotives.
6—37½ H.P. American 2 drum elec. hoists.
2—I.R. No. 50 drill sharpeners.
I.R. 4½x12 Quarry Bar and X71 Drifter.

COAST-TO-COAST EQUIP. CORP.

101 W. 31st St. New York, N. Y.

CLASSIFIED ADVERTISEMENTS

USED EQUIPMENT

DEPENDABLE EQUIPMENT

1—10B3, 2—9B3 and 1 No. 7 **McKiernan-Terry Steam Hammers.**
1—3-Drum **Thomas Elec. Hoist** with boom swinger
1—75-B, 1½-yd. **Gas Shovel**
1—75-B, 1¼-yd. **Gas Shovel**—Dragline 55' boom, 1-yd. bucket
1—50-B **Bucyrus Deisel Dragline**
1—50-B **Bucyrus Steam Shovel**
1—50-B **Bucyrus Steam Crane**
2—**Vulcan**, 16-ton gasoline locomotives.
7—21-ton, 11x16, Std. Ga. **Davenport & Vulcan Locos.**
2—25-ton, 12x16, Std. Ga. **Davenport Loco.**
1—28-ton, 12x18, Std. Ga. **Vulcan Steam Loco.**
2—38-ton, 14x22, Std. Ga. **American Steam Loco.**
4—50-ton, 17x24, **Davenport, 6-wheel Switchers**
2—No. 8-C **Browning Steam Locomotive Cranes**
12-yd., 16-yd., 20-yd., 30-yd. standard gauge **Dump Cars**
General Construction Equipment

CLAPP, RILEY & HALL EQUIPMENT CO.
14 North Clinton St., Chicago, Illinois

GYRATORY CRUSHERS: 20", 24" & 42" McCully; Nos. 4, 5, 6, 9 & 16 Telsmith; Nos. 3, 4, 5, 6, 7½, 8, 9 & 10 various makes. One 16" Superior McCully.
REDUCTION CRUSHERS: 6, 10 & 18" Super. McCully fine, 7" Newhouse, 37 Kennedy, 36" Disc, 2' Cone, etc.
JAW CRUSHERS: 84x66 Traylor, 52x72, 54x36 & 40x30 Buchanan; 24x36 Farrel; 10x40 Good Roads; 9x36, 15x36 and others various sizes & makes.
ROLLS: 36x60 Fairmont & 36x16, 40x15, 54x24 A-C.
HAMMERMILLS: Nos. 3, 5 & 9 Williams and others.
MILLS: Kennedy 5x6' & 5x8' Ball; Kent 24"x7"; 48" Fuller-Lehigh & Raymonds of various sizes.
SCREENS: 4x8 & 3x8 Niagara double-deck.
CARS: 6 Yd. Koppel & 20 Yd. Western, 8td. Ga.
ELEVATOR: 80' c-c, 30x40" buckets, 50 HP motor.
CONVEYORS: 24"x25' & 57' & 36"x194' with motors.
SHOVEL: 1½ Yd. Osgood new 1937 used 5 months.
Bins, Boilers, Buckets, Cableways, Conveyors, Cranes, Dryers, Derricks, Drills, Draglines, Hoists, Kilns, Loaders, Screens, Slacklines, Shovels, Scales and many other items located throughout the United States at bargain prices.

ALEXANDER T. McLEOD
7229 Rogers Avenue, Chicago, or Marietta, Kansas

COMPRESSORS
FROM COMPRESSOR HEADQUARTERS
(Single Stage)

3—310 (10x8) Ingersoll-Rand Portables.
3—220 (8x6) Ingersoll-Rand Portables.
1—160 (7x6) Ingersoll-Rand Portable.
1—6½x5 Chicago Pneumatic Portable.

EDWARD EHRBAR, INC.
29 Meserole Avenue **Brooklyn, N. Y.**

BARGAIN

No. 3 Standard Jay Bee Hammer Mill, complete with Fan and Dust Collector. Made by Bossert Corp., Utica, N. Y. 8K F Ball Bearings; 15¼x12 feed opening; 2,000 RPM; 6Dx8F pulley; 25 to 40 HP; 25"x58" floor space; 56" high; 36 Indestructible Steel Hammers; 1,500 lbs. total wt.; grinds coal, clay products, chemicals, limestone and granite. Costs $1,575.00 new. Used very little; Best offer takes it.

GRANITE PRODUCTS CO.
1819 W. Glendale Ave. **Milwaukee, Wis.**

For Sale—A Good Time to Buy.

Dragline, Page 420 electric 3½ yd.
Shovel, P. & H. diesel, 3½ yd., cat. mtd.
R.R. Cars, 1 each, new, 50 ton box and gondola.
Crushers, No. 18 MCc—7½ K—7½ D—6K.
Complete silica plant, central Illinois.
Loco. Crane, 20 ton R.R., 50'h. D/D.
Shovel, Koehring model, 1A—gas cat.

A. V. KONSBERG
111 W. Jackson Boulevard **Chicago**

3—50 HP electric shaft hoists.
½ yd. Byers comb. shovel crane.
¾ yd. Osgood comb. shovel crane.
¾ yd. Northwest shovel.
1 yd. Northwest shovel.
Owen & Hayward ¾ & 1 yd. buckets.
Compressors: 446, 310, 136, 110 ft.
Sullivan and I-Rand jackhammers.

J. T. WALSH
Brisbane Bldg. **Buffalo, N. Y.**

USED EQUIPMENT WANTED

WANTED

500 feet, 24" or 26", 6-ply Conveyor Belt, New or second hand. Submit samples and prices.

PAUL LIME PLANT, INC.
Paul Spur, Arizona

BUSINESS OPPORTUNITIES

TO LEASE

New, true dolomite quarry. Magnesium Carbonate 40-45%. Silica 1-3.5%. Shipments encouraged upon analysis. Large hill tonnage estimate. Seeing is believing. Profits for life. Close to shipping point. Strata right for operation. Advantageous freight rates. Big interest on investment. Owner unable to operate at present. Don't delay.

ALTON WASSON
R. D. No. 1 **ALTOONA, PA.**

FOR SALE OR LEASE

Located half way between New Orleans and Birmingham on U. S. Highway No. 11, and Great Southern Railroad, upwards of 3,000,000 cubic yards of flint concrete gravel and sand—silica pebbles and sand—1" to ¼" in sizes down. Cities of Laurel and Meridian builders pay $2 a ton retail for gravel and sand. I want a partner. Great demand for loose gravel and sand. House joists, blocks, brick, roofing tile, paving slabs, sewer piping. No competition here. For sale, lease, whole or a part interest. Free from all liens. A virgin field. $50,000.00.

ROBERT L. McLENDON (Owner)
McLendon Concrete Gravel & Sand Quarries
Vossburg, Miss.

CONSULTING ENGINEERS

RAY E. CRAUMER
CONSULTING ENGINEER
MINING - MECHANICAL - COMBUSTION
1617 So. 16th Ave., Maywood, Ill.
Phone Number Maywood 2836
33 years experience in Operation and Design
Safety work Air Conditioning Kilns
Management Incinerators Layouts

H. J. BROWN
CONSULTING ENGINEER
85 Doane Street, Boston, Massachusetts
Specializing in Gypsum Plants and in the Mining, Quarrying and Manufacture of Gypsum Products.
Consultation Design
Examinations Construction
Reports Supervision

H. D. RUHM
Consulting Engineer
PHOSPHATE LANDS
all grades of rock.
PHOSPHATE FILLER
40 years' experience TENNESSEE PHOSPHATE FIELD. Correspondence solicited Can find what you want if it can be found.
305 West Seventh St., Columbia, Tennessee

WE LOOK INTO THE EARTH
By using Diamond Core Drills We drill for Limestone, Gypsum Talc, Fire Clay, Coal and all other minerals
PENNSYLVANIA DRILLING CO
Drilling Contractors
Pittsburgh, Pa.

Wire or write us for
DIAMOND CORE DRILLING SERVICE
with thirty-five years' experience. Steam, Gasoline and Electric drills suitable for any job. Satisfactory cores guaranteed. Prices reasonable.

HOFFMAN BROTHERS DRILLING CO.
Drilling Contractors PUNXSUTAWNEY, PA.

POSITIONS WANTED

QUARRY SUPERINTENDENT DESIRES A permanent connection. 18 years' experience in operating trap rock, limestone quarries and crushing plants; also familiar with lime kilns and construction work. Excellent references. Address Box 661, care of Rock Products, 205 W. Wacker Dr., Chicago, Illinois.

MECHANICAL ENGINEER — GENERAL Cement Plant Expert—20 years' actual experience in diff. countries—designing, construction and full charge of Cement Plant operation, desires connection with Company for engagement. Address: Box 784, care of Rock Products, 205 W. Wacker Dr., Chicago.

POSITION WANTED AS PLANT SUPERintendent or Engineering Executive by an American graduate engineer, with twenty years' experience in the operation, design and construction of wet and dry cement plants, including experience in quarrying and mining. At present employed, but seeking a connection presenting a better opportunity. Address Box No. 794, care Rock Products, 205 W. Wacker Drive, Chicago, Ill.

GRAVEL OR STONE PLANT SUPT. WITH 12 years' experience in design and efficient operation of plants, desires permanent connection with progressive concern. College graduate, capable of any phase of production work, and development of new operations. References. Address Box 816, care of Rock Products, 205 W Wacker Drive, Chicago, Ill.

POSITIONS VACANT

SALESMAN WANTED — USED EQUIPment, Commission or Profit Sharing. Address Box 817, care of ROCK PRODUCTS, 205 W. Wacker Drive, Chicago, Ill.

Free **SERVICE to Subscribers**

To be of the utmost service to the industry is the aim of ROCK PRODUCTS.

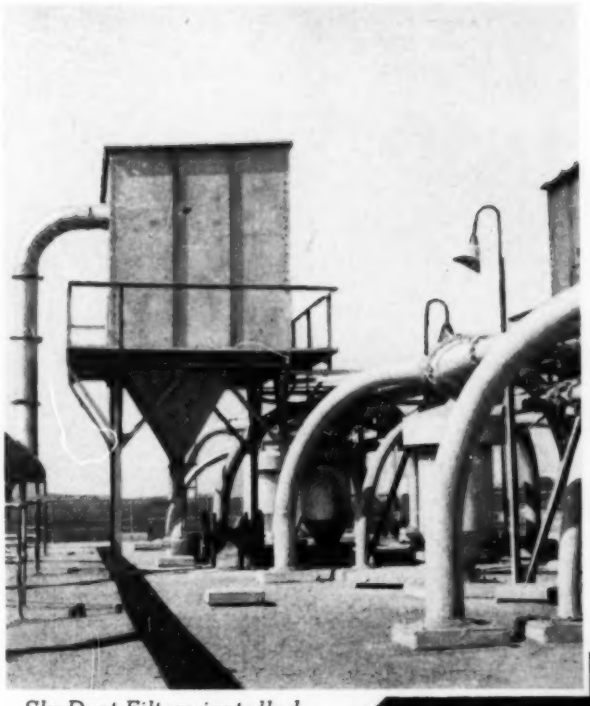
Our staff of experts is available for consultation either in person or by mail on any of your problems.

We also maintain a complete file of manufacturers catalogs and other pertinent information. Inquiries about various types of equipment, where to buy it, etc., gladly given.

Address your inquiries to
Research Service Department

Rock Products
205 W. Wacker Drive
CHICAGO

INDEX OF ADVERTISERS



Sly Dust Filters installed above cement silos

FILTER *the* DUST

Get Rid of it!

• Sly Dust Collectors are based upon scientific solution to the dust problem.

The cloth bag filter provides the safest means of controlling dust—from the largest to the finest particles.

The DUST is Filtered *out of the* AIR

With Sly positive dust collection, the dust is not merely settled, its course is not merely diverted to be let loose again later on. It is FILTERED OUT OF THE AIR—collected. Dust never reenters the air when collected by Sly.

Ask us to analyze your dust problem. A Sly sales engineer is near you.

The Sly cloth bag filter medium

THE W·W SLY MFG·CO·CLEVELAND·OHIO

RUBBER PILLOWS FOR RAILROAD BEDS

A typical example of Goodrich development in rubber

MILLIONS of tons of train pound over main-line rails, crunching and grinding the steel into the wooden tie. Naturally ties wear out—cost a tremendous annual sum for replacement.

An inventor had an idea—cut a square opening through the center of the steel tie plate that holds the rail in place; let the rail rest on a pad inserted in this opening, the pad resting directly on the tie, the rail never coming in contact with the metal of the tie plate. Pads of felt, fabric-and-rubber combinations were all tried, but failed. Then the inventor came to Goodrich and asked for rubber able to stand terrific shock and weight without losing its shape or resilience, able to withstand outdoor exposure for years without deterioration.

Goodrich rubber tie plate inserts were made and tested. They entirely eliminate tie wear by the tie plate. They reduce vibration. They increase life of ties indefinitely and lower track-maintenance cost.

Goodrich was able to supply the rubber needed for this exacting use because of this Company's rubber research and development work. This research has resulted in many kinds of rubber with vastly improved resistance to ageing, and with ability to stand abrasion, flexing, chemicals which would have destroyed rubber as you used to know it. Many of these improvements are used in all Goodrich products—hose, transmission belting, conveyor belting, molded goods—to make them last longer and save money for the buyer. The B. F. Goodrich Company, Mechanical Rubber Goods Division, Akron, Ohio.

Goodrich

ALL *products problems* IN RUBBER

● "Sure it costs a little more—but listen: the increased service you will get out of LAY-SET Preformed will more than justify the slight differential in first cost. For instance:

"Your men can reeve LAY-SET in place and get your machine back into profitable production in about half the time they would spend on non-preformed. Then, with LAY-SET, your machine will have much longer continuous operation—because LAY-SET will last longer.

"If LAY-SET Preformed wears out to the point where the crown wires part—they won't wicker out to jab workmen's hands. It's a safe rope to handle. It resists kinking; almost refuses to whip and spools on the drum perfectly. Being preformed it resists the fatigue of reverse bending. Believe me, sir (and we've been in business for 91 years) LAY-SET Preformed is a much better rope."

HAZARD WIRE ROPE DIVISION
ESTABLISHED 1846
AMERICAN CHAIN & CABLE COMPANY, Inc.
WILKES-BARRE, PENNSYLVANIA

District Offices: New York, Chicago, Philadelphia, Pittsburgh, Fort Worth, San Francisco, Denver, Los Angeles, Birmingham, Tacoma

GREEN SIGNIFIES SAFETY

In Business for Your Safety

A FEW OF THE 137 AMERICAN CHAIN & CABLE INDUSTRIAL PRODUCTS

AMERICAN CHAIN DIVISION
(DOMINION CHAIN COMPANY, Ltd., in Canada)
Weed Tire Chains • Welded and Weldless Chain • Malleable Castings • Railroad Specialties

ANDREW C. CAMPBELL DIVISION
Abrasive Cutting Machines • Floformers Special Machinery • Nibbling Machines

FORD CHAIN BLOCK DIVISION
Chain Hoists • Trolleys

HAZARD WIRE ROPE DIVISION
Green Strand Wire Rope • "Korodless" Wire Rope • Preformed Spring-Lay Wire Rope • Guard Rail Cable

HIGHLAND IRON & STEEL DIVISION
Wrought Iron Bars and Shapes

MANLEY MANUFACTURING DIVISION
Automotive Service Station Equipment

OWEN SILENT SPRING COMPANY, Inc.
Owen Cushion and Mattress Spring Centers

PAGE STEEL AND WIRE DIVISION
Page Fence • Wire and Rod Products Traffic Tape • Welding Wire

READING-PRATT & CADY DIVISION
Valves • Electric Steel Fittings

READING STEEL CASTING DIVISION
Electric Steel Castings, Rough or Machined

WRIGHT MANUFACTURING DIVISION
Chain Hoists • Electric Hoists and Cranes

LAY·SET *Preformed* WIRE ROPE

ALL HAZARD WIRE ROPES MADE OF IMPROVED PLOW STEEL ARE IDENTIFIED BY THE GREEN STRAND

BUCYRUS-ERIE

Simple BOOM MACHINERY

The boom-machinery on Bucyrus-Erie's famous 120-B presents an unusual combination of simplicity, strength, smooth-flowing power and light weight. There are only four gears from the motor to the shipper-shaft which is held in large bearings, an integral part of the boom. The motor drives the shipper-shaft through two gear reductions, the intermediate shaft of which is mounted in anti-friction bearings with all gears completely enclosed and running in oil. The motor has on its shaft an automatic solenoid brake, spring set and power released, which serves to hold the machinery when the power is shut off. A safety clutch protects the machinery against shock. The new 120-B bulletin will give you the full story on this modern, big-output quarry and mining shovel.

BUCYRUS ERIE

BUCYRUS-ERIE CO. • SOUTH MILWAUKEE, WISCONSIN, U. S. A.
EXCAVATING, DRILLING AND MATERIAL HANDLING EQUIPMENT.

622W